Package ‘PriceIndices’

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VignetteBuilder knitr

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Calculating the bilateral AG Mean price index

This function returns a value (or vector of values) of the bilateral AG Mean price index.
Usage

agmean(data, start, end, sigma = 0.7, interval = FALSE)

Arguments

- **data**: The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".

- **sigma**: The elasticity of substitution parameter (as numeric).

- **interval**: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral AG Mean price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

agmean(sugar, start="2019-01", end="2020-01", sigma=0.5)
agmean(milk, start="2018-12", end="2020-01", interval=TRUE)

available

Providing values from the indicated column that occur at least once in one of the compared periods or in a given time interval

Description

The function returns all values from the indicated column (defined by the type parameter) which occur at least once in one of the compared periods or in a given time interval.
Usage

available(data, period1, period2, type = "prodID", interval = FALSE)

Arguments

data  The user's data frame. It must contain a column time (as Date in format: year-month-day, e.g. '2020-12-01') and also a column indicated by the type parameter.

period1  The first period (as character) limited to the year and month, e.g. "2019-03".

period2  The second period (as character) limited to the year and month, e.g. "2019-04".

type  This parameter defines the column which is used in the procedure. Possible values of the type parameter are: retID, prodID, codeIN, codeOUT or description.

interval  A logical parameter indicating whether the procedure is to work for the whole time period between period1 and period2 (then it is TRUE).

Value

The function returns all values from the indicated column (defined by the type parameter) which occur at least once in one of the compared periods or in a given time interval. Possible values of the type parameter are: retID, prodID, codeIN, codeOUT or description. If the interval parameter is set to FALSE, then the function compares only periods defined by period1 and period2. Otherwise the whole time period between period1 and period2 is considered.

Examples

available(milk, period1="2018-12", period2="2019-12", interval=TRUE)
available(milk, period1="2018-12", period2="2019-12", type="description")

---

**banajree**

*Calculating the bilateral Banajree price index*

Description

This function returns a value (or vector of values) of the bilateral Banajree price index.

Usage

banajree(data, start, end, interval = FALSE)
Arguments

data: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. "2020-03".

end: The research period (as character) limited to the year and month, e.g. "2020-04".

interval: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Banajree price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

```r
banajree(sugar, start="2018-12", end="2019-12")
banajree(milk, start="2018-12", end="2020-01", interval=TRUE)
```

Description

This function returns a value (or vector of values) of the bilateral Bialek price index.

Usage

```r
bialek(data, start, end, interval = FALSE)
```
Arguments

data  The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Bialek price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

bialek(sugar, start="2018-12", end="2019-12")
bialek(milk, start="2018-12", end="2020-01", interval=TRUE)

Calculating the unweighted BMW price index

Description

This function returns a value (or vector of values) of the unweighted Balk-Mehrhoff-Walsh (BMW) price index.
Usage

bmw(data, start, end, interval = FALSE)

Arguments

data User’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start The base period (as character) limited to the year and month, e.g. "2020-03".

data The research period (as character) limited to the year and month, e.g. "2020-04".

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start, end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the unweighted bilateral BMW price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

bmw(sugar, start="2018-12", end="2019-12")

bmw(milk, start="2018-12", end="2020-01", interval=TRUE)

carli Calculating the unweighted Carli price index

Description

This function returns a value (or vector of values) of the unweighted bilateral Carli price index.
Usage

carli(data, start, end, interval = FALSE)

Arguments

data: The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.
sstart: The base period (as character) limited to the year and month, e.g. "2020-03".
end: The research period (as character) limited to the year and month, e.g. "2020-04".
interval: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the unweighted bilateral Carli price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

carli(sugar, start="2018-12", end="2019-12")
carli(milk, start="2018-12", end="2020-01", interval=TRUE)

ccdi

Calculating the multilateral GEKS price index based on the Tornqvist formula (typical notation: GEKS-T or CCDI)

Description

This function returns a value of the multilateral CCDI price index, i.e. the GEKS price index based on the superlative Tornqvist index formula.
Usage

ccdi(data, start, end, wstart = start, window = 13)

Arguments

data
The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
The base period (as character) limited to the year and month, e.g. "2020-03".

data
The research period (as character) limited to the year and month, e.g. "2020-04".

wstart
The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".

window
The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

Value

This function returns a value of the multilateral CCDI price index (to be more precise: the GEKS index based on the Tornqvist formula) which considers the time window defined by wstart and window parameters. It measures the price dynamics by comparing period end to period start (both start and end must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

ccdi(milk, start="2019-01", end="2019-08", window=10)
ccdi(milk, start="2018-12", end="2019-12")
ccdi_fbew Extending the multilateral CCDI price index by using the FBEW method.

Description
This function returns a value of the multilateral CCDI price index (GEKS based on the Tornqvist formula) extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

Usage
ccdi_fbew(data, start, end)

Arguments
data
The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
The base period (as character) limited to the year and month, e.g. "2019-12".

end
The research period (as character) limited to the year and month, e.g. "2020-04".

Value
This function returns a value of the multilateral CCDI price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods end and start. The month of the start parameter must be December. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples
ccdi_fbew(milk, start="2018-12", end="2019-08")
Description

This function returns a value of the multilateral CCDI price index (GEKS based on the Tornqvist formula) extended by using the FBMW (Fixed Base Moving Window) method.

Usage

ccdi_fbmw(data, start, end)

Arguments

data: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. "2020-12-01"), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. "2019-12".

end: The research period (as character) limited to the year and month, e.g. "2020-04".

Value

This function returns a value of the multilateral CCDI price index extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

ccdi_fbmw(milk, start="2019-12", end="2020-04")
Description

This function returns a value (or values) of the multilateral CCDI price index (GEKS based on the Tornqvist formula) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage

```r
ccdi_splice(
data,  
start,  
end,  
window = 13,  
splice = "movement",  
interval = FALSE
)
```

Arguments

data  The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2019-12".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

window  The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

splice  A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

interval  A logical value indicating whether the function is to provide the price index comparing the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by `start`).

Value

This function returns a value or values (depending on `interval` parameter) of the multilateral CCDI price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices.
Published indices (see References). The time window starts in \textit{start} and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: \texttt{price\_index}, \texttt{price\_indices} or \texttt{final\_index}. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the \texttt{final\_index} or the \texttt{final\_index2} function).

\section*{References}


\section*{Examples}

\begin{verbatim}
ccdi.splice(milk, start="2018-12", end="2020-02",splice="half")
ccdi.splice(milk, start="2018-12", end="2020-02",window=10,interval=TRUE)
\end{verbatim}

\begin{verbatim}
chagmean
\end{verbatim}

\textit{Calculating the monthly chained AG Mean price index}

\section*{Description}

This function returns a value (or vector of values) of the monthly chained AG Mean price index.

\section*{Usage}

\begin{verbatim}
chagmean(data, start, end, sigma = 0.7, interval = FALSE)
\end{verbatim}

\section*{Arguments}

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>data</td>
<td>The user's data frame with information about sold products. It must contain columns: \texttt{time} (as Date in format: year-month-day, e.g. '2020-12-01'), \texttt{prices} (as positive numeric), \texttt{quantities} (as positive numeric) and \texttt{prodID} (as numeric, factor or character).</td>
</tr>
<tr>
<td>start</td>
<td>The base period (as character) limited to the year and month, e.g. &quot;2020-03&quot;.</td>
</tr>
<tr>
<td>end</td>
<td>The research period (as character) limited to the year and month, e.g. &quot;2020-04&quot;.</td>
</tr>
<tr>
<td>sigma</td>
<td>The elasticity of substitution parameter (as numeric).</td>
</tr>
</tbody>
</table>
interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained AG Mean price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chagmean(sugar, start="2019-01", end="2019-04", sigma=0.5)
chagmean(milk, start="2018-12", end="2020-01", interval=TRUE)

chbanajree Calculating the monthly chained Banajree price index

Description

This function returns a value (or vector of values) of the monthly chained Banajree price index.

Usage

chbanajree(data, start, end, interval = FALSE)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2020-03".

end The research period (as character) limited to the year and month, e.g. "2020-04".

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Banajree price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chbanajree(sugar, start="2018-12", end="2019-04")
chbanajree(milk, start="2018-12", end="2020-01", interval=TRUE)

**chbialek**

*Calculating the monthly chained Bialek price index*

**Description**

This function returns a value (or vector of values) of the monthly chained Bialek price index.

**Usage**

chbialek(data, start, end, interval = FALSE)

**Arguments**

data: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. "2020-03".

end: The research period (as character) limited to the year and month, e.g. "2020-04".

interval: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Bialek price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chbialek(sugar, start="2018-12", end="2019-04")
chbialek(milk, start="2018-12", end="2020-01", interval=TRUE)

chbmw

Calculating the monthly chained BMW price index

Description

This function returns a value (or vector of values) of the monthly chained Balk-Mehrhoff-Walsh (BMW) price index.

Usage

chbmw(data, start, end, interval = FALSE)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start The base period (as character) limited to the year and month, e.g. ”2020-03”.

end The research period (as character) limited to the year and month, e.g. ”2020-04”.

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained BMW price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
chbmw(sugar, start="2018-12", end="2019-04")
chbmw(milk, start="2018-12", end="2020-01", interval=TRUE)
```

chcarli

*Calculating the monthly chained Carli price index*

Description

This function returns a value (or vector of values) of the monthly chained Carli price index.

Usage

```r
chcarli(data, start, end, interval = FALSE)
```

Arguments

data

The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric) and `prodID` (as numeric, factor or character). A column `quantities` (as positive numeric) is also needed because this function uses unit values as monthly prices.

start

The base period (as character) limited to the year and month, e.g. "2020-03".

end

The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
chcswd

Calculating the monthly chained CSWD price index

Description

This function returns a value (or vector of values) of the monthly chained Carruthers-Sellwood-Ward-Dalen (CSWD) price index.

Usage

chcswd(data, start, end, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. "2020-12-01"), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Carli price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chcarli(sugar, start="2018-12", end="2019-04")
chcarli(milk, start="2018-12", end="2020-01", interval=TRUE)
The function returns a value (or vector of values) of the monthly chained CSWD price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chcswd(sugar, start="2018-12", end="2019-04")
chcswd(milk, start="2018-12", end="2020-01", interval=TRUE)

Description

This function returns a value (or vector of values) of the monthly chained Davies price index.

Usage

chdavies(data, start, end, interval = FALSE)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2020-03".

end The research period (as character) limited to the year and month, e.g. "2020-04".

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Davies price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chdavies(sugar, start="2018-12", end="2019-04")
chdavies(milk, start="2018-12", end="2020-01", interval=TRUE)

chdrobisch

Calculating the monthly chained Drobisch price index

Description

This function returns a value (or vector of values) of the monthly chained Drobisch price index.

Usage

chdrobisch(data, start, end, interval = FALSE)

Arguments

data

The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. "2020-03".

end

The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Dutot price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

chdrobisch(sugar, start="2018-12", end="2019-04")
chdrobisch(milk, start="2018-12", end="2020-01", interval=TRUE)

---

### Description

This function returns a value (or vector of values) of the monthly chained Dutot price index.

### Usage

```r
chdutot(data, start, end, interval = FALSE)
```

### Arguments

- **data**
  - The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

- **start**
  - The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**
  - The research period (as character) limited to the year and month, e.g. "2020-04".

- **interval**
  - A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Dutot price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
chdutot(sugar, start="2018-12", end="2019-04")
chdutot(milk, start="2018-12", end="2020-01", interval=TRUE)
```

chfisher

*Calculating the monthly chained Fisher price index*

Description

This function returns a value (or vector of values) of the monthly chained Fisher price index.

Usage

```r
chfisher(data, start, end, interval = FALSE)
```

Arguments

data

The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. "2020-03".

end

The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Fisher price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chfisher(sugar, start="2018-12", end="2019-04")
chfisher(milk, start="2018-12", end="2020-01", interval=TRUE)

chgeary_khamis  Calculating the monthly chained Geary-Khamis price index

Description

This function returns a value (or vector of values) of the monthly chained Geary-Khamis price index.

Usage

chgeary_khamis(data, start, end, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
start  The base period (as character) limited to the year and month, e.g. "2020-03".
end    The research period (as character) limited to the year and month, e.g. "2020-04".
interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).
Value

The function returns a value (or vector of values) of the monthly chained Geary-Khamis price index depending on the interval parameter (please use `gk` function to calculate the multilateral Geary-Khamis price index). If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
chgeary_khamis(sugar, start="2018-12", end="2019-04")
chgeary_khamis(milk, start="2018-12", end="2020-01", interval=TRUE)
```

### chgeohybrid

**Calculating the the monthly chained geohybrid price index**

Description

This function returns a value (or vector of values) of the monthly chained geohybrid price index. The geohybrid index was proposed by Bialek (2020) and it uses correlation coefficients between prices and quantities.

Usage

```r
chgeohybrid(data, start, end, base = start, interval = FALSE)
```

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
The prior period used in the geohybrid price index formula (as character) limited to the year and month, e.g. "2020-01"

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

The function returns a value (or vector of values) of the monthly chained geo-logarithmic Laspeyres price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).


chgeolastepares(data, start, end, interval = FALSE)

The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

The base period (as character) limited to the year and month, e.g. "2020-03".
The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained geo-logarithmic Laspeyres price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product sub-groups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chgeolaspeyres(sugar, start="2018-12", end="2019-04")
chgeolaspeyres(milk, start="2018-12", end="2020-01", interval=TRUE)

data

The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. “2020-03”.
The research period (as character) limited to the year and month, e.g. "2020-04".

The prior period used in the geometric Lowe price index formula (as character) limited to the year and month, e.g. "2020-01"

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

The function returns a value (or vector of values) of the monthly chained geometric Lowe price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chgeolowe(sugar, start="2019-01", end="2019-04",base="2018-12")
chgeolowe(milk, start="2018-12", end="2020-01", interval=TRUE)
The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained geo-logarithmic Paasche price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product sub-groups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chgeopaasche(sugar, start="2018-12", end="2019-04")
chgeopaasche(milk, start="2018-12", end="2020-01", interval=TRUE)

chgeoyoung

*Calculating the monthly chained geometric Young price index*

Description

This function returns a value (or vector of values) of the monthly chained geometric Young price index.

Usage

chgeoyoung(data, start, end, base = start, interval = FALSE)

Arguments

data

The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. "2020-03".
chharmonic

end The research period (as character) limited to the year and month, e.g. "2020-04".
base The prior period used in the geometric Young price index formula (as character) limited to the year and month, e.g. "2020-01".
interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start, end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained geometric Young price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chgeoyoung(sugar, start="2019-01", end="2019-04", base="2018-12")
chgeoyoung(milk, start="2018-12", end="2020-01", interval=TRUE)

chharmonic

Calculating the monthly chained harmonic price index

Description

This function returns a value (or vector of values) of the monthly chained "unnamed" harmonic price index.

Usage

chharmonic(data, start, end, interval = FALSE)
Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start The base period (as character) limited to the year and month, e.g. "2020-03".

end The research period (as character) limited to the year and month, e.g. "2020-04".

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start, end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained harmonic price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chharmonic(sugar, start="2018-12", end="2019-04")
chharmonic(milk, start="2018-12", end="2020-01", interval=TRUE)

chhybrid Calculating the the monthly chained hybrid price index

Description

This function returns a value (or vector of values) of the monthly chained hybrid price index. The hybrid index was proposed by Bialek (2020) and it uses correlation coefficients between prices and quantities.

Usage

chhybrid(data, start, end, base = start, interval = FALSE)
Arguments

data: The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. "2020-03".

end: The research period (as character) limited to the year and month, e.g. "2020-04".

base: The prior period used in the hybrid price index formula (as character) limited to the year and month, e.g. "2020-01".

interval: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained hybrid price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chhybrid(sugar, start="2019-12", end="2020-05", base="2018-12")
chhybrid(milk, start="2019-12", end="2020-08", base="2018-12", interval=TRUE)
Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Jevons price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chjevons(sugar, start="2018-12", end="2019-04")
chjevons(milk, start="2018-12", end="2020-01", interval=TRUE)

chlaspeyres  Calculating the monthly chained Laspeyres price index

Description

This function returns a value (or vector of values) of the monthly chained Laspeyres price index.

Usage

chlaspeyres(data, start, end, interval = FALSE)
chlehr

Calculating the monthly chained Lehr price index

Description

This function returns a value (or vector of values) of the monthly chained Lehr price index.

Usage

chlehr(data, start, end, interval = FALSE)
Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

date  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Lehr price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References

Lehr, J. (1885). Beitrage zur Statistik der Preise, insbesondere des Geldes und des Holzes. J. D. Sauerlander, Frankfurt am Main.


Examples

chlehr(sugar, start="2018-12", end="2019-04")
chlehr(milk, start="2018-12", end="2020-01", TRUE)
Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".

- **sigma**: The elasticity of substitution parameter (as numeric).

- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Lloyd-Moulton price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
chlloyd_moulton(sugar, start="2018-12", end="2019-04", sigma=0.9)
chllloyd_moulton(milk, start="2018-12", end="2020-01", interval=TRUE)
```

**Calculating the monthly chained Lowe price index**

Description

This function returns a value (or vector of values) of the monthly chained Lowe price index.
Usage

chlowe(data, start, end, base = start, interval = FALSE)

Arguments

data The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. ’2020-12-01’), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. ”2020-03”.

end The research period (as character) limited to the year and month, e.g. ”2020-04”.

base The prior period used in the Lowe price index formula (as character) limited to the year and month, e.g. ”2020-01”.

interval A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Lowe price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

chlowe(sugar, start=”2019-01”, end=”2019-04”, base=”2018-12”)

chlowe(milk, start=”2018-12”, end=”2020-01”, interval=TRUE)

Description

This function returns a value (or vector of values) of the monthly chained Marshall-Edgeworth price index.
Usage

`chmarshall_edgeworth(data, start, end, interval = FALSE)`

Arguments

data  The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Marshall-Edgeworth price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

`chmarshall_edgeworth(sugar, start="2018-12", end="2019-04")`
`chmarshall_edgeworth(milk, start="2018-12", end="2020-01", interval=TRUE)`
Calculating the monthly chained Paasche price index

Description
This function returns a value (or vector of values) of the monthly chained Paasche price index.

Usage
chpaasche(data, start, end, interval = FALSE)

Arguments
- **data**: The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value
The function returns a value (or vector of values) of the monthly chained Paasche price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References

Examples
chpaasche(sugar, start="2018-12", end="2019-04")
chpaasche(milk, start="2018-12", end="2020-01", interval=TRUE)
Calculating the monthly chained Palgrave price index

Description

This function returns a value (or vector of values) of the monthly chained Palgrave price index.

Usage

chpalgrave(data, start, end, interval = FALSE)

Arguments

data  The user's data frame with information about sold products. It must contain
columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices
(as positive numeric), quantities (as positive numeric) and prodID (as nu-
meric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period
defined by end to the base period defined by start (then interval is set to
FALSE) or all fixed base indices are to be calculated. In this latter case, all
months from the time interval <start,end> are considered and start defines
the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Palgrave price index
depending on the interval parameter. If the interval parameter is set to TRUE, the function
returns a vector of price index values without dates. To get information about both price index values
and corresponding dates, please see functions: price_index, price_indices or final_index.
The function does not take into account aggregating over outlets or product subgroups (to consider
these types of aggregating, please use the final_index or the final_index2 function).

References

Palgrave, R. H. I. (1886). Currency and Standard of Value in England, France and India and the
Rates of Exchange Between these Countries. Memorandum submitted to the Royal Commission on


Examples

chpalgrave(sugar, start="2018-12", end="2019-04")
chpalgrave(milk, start="2018-12", end="2020-01", interval=TRUE)
Calculating the monthly chained Vartia-II (Sato-Vartia) price index

Description

This function returns a value (or vector of values) of the monthly chained Vartia-II (Sato-Vartia) price index.

Usage

chsato_vartia(data, start, end, interval = FALSE)

Arguments

data

The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. "2020-03".

end

The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Vartia-II (Sato-Vartia) price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

```r
chsato_vartia(sugar, start="2018-12", end="2019-04")
chsato_vartia(milk, start="2018-12", end="2020-01", interval=TRUE)
```

Calculating the monthly chained Stuvel price index

Description

This function returns a value (or vector of values) of the monthly chained Stuvel price index.

Usage

```r
chstuvel(data, start, end, interval = FALSE)
```

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Stuvel price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

chtuvel(sugar, start="2018-12", end="2019-04")
chtuvel(milk, start="2018-12", end="2020-01", interval=TRUE)

chtornqvist Calculating the monthly chained Tornqvist price index

Description

This function returns a value (or vector of values) of the monthly chained Tornqvist price index.

Usage

chtornqvist(data, start, end, interval = FALSE)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
start The base period (as character) limited to the year and month, e.g. "2020-03".
end The research period (as character) limited to the year and month, e.g. "2020-04".
interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Tornqvist price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index.
The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


chvartia

Examples

chtornqvist(sugar, start="2018-12", end="2019-04")
chtornqvist(milk, start="2018-12", end="2020-01", interval=TRUE)

chvartia  Calculating the monthly chained Vartia-I price index

Description

This function returns a value (or vector of values) of the monthly chained Vartia-I price index.

Usage

chvartia(data, start, end, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
start  The base period (as character) limited to the year and month, e.g. "2020-03".
end  The research period (as character) limited to the year and month, e.g. "2020-04".
interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Vartia-I price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chvartia(sugar, start="2018-12", end="2019-04")
chvartia(milk, start="2018-12", end="2020-01", interval=TRUE)

Description

This function returns a value (or vector of values) of the monthly chained Walsh price index.

Usage

chwalsh(data, start, end, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Walsh price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


chyoung

Examples

chwalsh(sugar, start="2018-12", end="2019-04")
chwalsh(milk, start="2018-12", end="2020-01", interval=TRUE)

chyoung                                   Calculating the monthly chained Young price index

Description

This function returns a value (or vector of values) of the monthly chained Young price index.

Usage

chyoung(data, start, end, base = start, interval = FALSE)

Arguments

data             The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
start            The base period (as character) limited to the year and month, e.g. "2020-03".
end              The research period (as character) limited to the year and month, e.g. "2020-04".
base             The prior period used in the Young price index formula (as character) limited to the year and month, e.g. "2020-01".
interval         A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the monthly chained Young price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

chyoung(sugar, start="2019-01", end="2019-04", base="2018-12")
chyoung(milk, start="2018-12", end="2020-01", interval=TRUE)

coffee

A real data set on sold coffee

Description

A collection of scanner data on the sale of coffee in one of Polish supermarkets in the period from December 2017 to October 2020

Usage

coffee

Format

A data frame with 6 columns and 42561 rows. The used variables are as follows:

- time - Dates of transactions (Year-Month-Day)
- prices - Prices of sold products [PLN]
- quantities - Quantities of sold products [kg]
- prodID - Unique product codes (data set contains 79 different prodIDs)
- retID - Unique codes identifying outlets/retailer sale points (data set contains 20 different retIDs)
- description - Descriptions of sold coffee products (data set contains 3 different product descriptions)

compare_final_indices

A general function for graphical comparison of price indices

Description

This function returns a figure with plots of previously calculated price indices.

Usage

compare_final_indices(finalindices = list(), names = c())
Arguments

finalindices A list of data frames with previously calculated price indices. Each data frame must consist of two columns, i.e. the first column must include dates limited to the year and month (e.g.: "2020-04") and the second column must indicate price index values for corresponding dates. The above-mentioned single data frame may be created manually in the previous step or it may be a result of functions: price_index or final_index. All considered data frames must have an identical number of rows.

names A vector of character strings describing names of presented indices.

Value

This function returns a figure with plots of previously calculated price indices. It allows for graphical comparison of price index values which were previously calculated and now are provided as data frames (see finalindices parameter).

Examples

## Calculating two indices by using two different package functions:
index1 <- final_index(datasets=list(milk), start="2018-12", end="2019-12", formula="walsh", interval=TRUE)
index2 <- price_index(milk, start="2018-12", end="2019-12", formula="geks", interval=TRUE)
## Graphical comparison of these two indices
compare_final_indices(finalindices=list(index1,index2), names=c("Walsh index", "GEKS index"))

Description

This function returns a figure with plots of selected price indices.

Usage

compare_indices(
  data,
  start,
  end,
  bilateral = c(),
  bindex = c(),
  base = c(),
  cesindex = c(),
  sigma = c(),
  simindex = c(),
  fbmulti = c(),
)
```r
fbwindow = c(),
splicemulti = c(),
splicewindow = c(),
splice = c(),
namebilateral = bilateral,
namebindex = bindex,
namecesindex = cesindex,
namesimindex = simindex,
namefbmulti = fbmulti,
namesplicemulti = splicemulti
)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities is also essential (as positive numeric) because unit values are calculated.

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

bilateral A vector of character strings indicating bilateral price index formulas that are to be calculated. To see available options please use the link: PriceIndices.

bindex A vector of character strings indicating Lowe- or Young-type price index formulas that are to be calculated. Available options are: young, geoyoung, lowe and geolowe.

base The vector of prior periods used in the Young- or Lowe-type price indices. Each element of the vector (as character) must be limited to the year and month, e.g. "2020-01".

cesindex A vector of character strings indicating CES price index formulas that are to be calculated. To see available options, please use the link: PriceIndices.

sigma The vector of elasticity of substitution parameters used in the Lloyed-Moulton and AG Mean indices.

simindex A vector of character strings indicating multilateral price index formulas based on relative price and quantity similarity that are to be calculated. To see available options, please use the link: PriceIndices.

fbmulti A vector of character strings indicating multilateral price index formulas that are to be calculated. The available set of indices includes full-window multilateral indices or their FBEW and FBMW extensions. To see available options, please use the link: PriceIndices.

fbwindow A vector of integers. Each element of the vector defines the length of the time window of the corresponding multilateral index (if it is selected by fbmulti).

splicemulti The vector of character strings indicating multilateral price index formulas are to be extended by using splicing methods. To see available options please use the link: PriceIndices.
```
splicewindow: A vector of integers. Each element of the vector defines the length of the time window of the corresponding multilateral index (if it is selected by splicemulti).

splice: A vector of character strings. Each element of the vector indicates the splicing method to be used for the corresponding multilateral index (if it is selected by splicemulti). Available values of vector elements are: "movement", "window", "half", "mean".

namebilateral: A vector of character strings describing names of bilateral price indices that are to be displayed. If this vector is empty, then default names are used.

namebindex: A vector of character strings describing names of Young- and/or Lowe-type price indices are to be displayed. If this vector is empty then default names are used.

namecesindex: A vector of character strings describing names of CES price indices that are to be displayed. If this vector is empty, then default names are used.

namesimindex: A vector of character strings describing names of multilateral price index formulas based on relative price and quantity similarity that are to be displayed. If this vector is empty, then default names are used.

namefbmulti: A vector of character strings describing names of full-window multilateral indices or their FBEW and FBMW extensions that are to be displayed. If this vector is empty, then default names are used.

namesplicemulti: A vector of character strings describing names of multilateral splice indices that are to be displayed. If this vector is empty, then default names are used.

Value

This function calculates selected bilateral or/and multilateral price indices and returns a figure with plots of these indices (together with dates on X-axis and a corresponding legend). The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use functions: final_index and compare_final_indices).

Examples

```r
compare_indices(milk, start="2018-12", end="2019-04", bilateral=c("jevons"), fbmulti=c("tpd"), fbwindow=c(6))
compare_indices(milk, start="2018-12", end="2019-05", fbmulti=c("tpd","geks"), fbwindow=c(10,12))
```

Description

This function returns a value (or vector of values) of the unweighted Carruthers-Sellwood-Ward-Dalen (CSWD) price index.

Calculating the unweighted CSWD price index
Usage

{cswd}(data, start, end, interval = FALSE)

Arguments

data
The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start
The base period (as character) limited to the year and month, e.g. "2020-03".

end
The research period (as character) limited to the year and month, e.g. "2020-04".

interval
A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the unweighted bilateral CSWD price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

cswd(sugar, start="2018-12", end="2019-12")
cswd(milk, start="2018-12", end="2020-01", interval=TRUE)
dataAGGR

A small artificial scanner data set for a demonstration of data aggregation

Description
A collection of artificial scanner data on milk products sold in three different months

Usage
dataAGGR

Format
A data frame with 6 columns and 9 rows. The used variables are as follows:
time - Dates of transactions (Year-Month-Day: 4 different dates)
prices - Prices of sold products [PLN]
quantities - Quantities of sold products [l]
prodID - Retailer product codes (3 prodIDs)
retID - Unique codes identifying outlets/retailer sale points (4 retIDs)
description - Descriptions of sold products (two subgroups: goat milk, powdered milk)

dataCOICOP

An artificial scanner data set for the product classification

Description
A collection of artificial scanner data on the sale of tomatoes, fruit juices, low fat milk, full fat milk, sugar, chocolate, yoghurt, coffee, eggs and salt in the period from December 2018 to October 2020

Usage
dataCOICOP

Format
A data frame with 8 columns and 96600 rows (some rows are not complete). The used variables are as follows:
time - Dates of transactions (Year-Month-Day)
prices - Prices of sold products [EUR]
quantities - Quantities of sold products [unit defined in the 'unit' column]
prodID - Retailer product codes
dataMATCH

An artificial scanner data set for product matching

Description

A collection of scanner data on the sale of sample artificial products.

Usage
dataMATCH

Format

A data frame with 7 columns and 30 rows. The used variables are as follows:

time - Dates of transactions (Year-Month-Day)
prices - Prices of sold products [PLN]
quantities - Quantities of sold products [liters]

codeIN - Unique internal (retailer) product codes (data set contains 5 different codeINs)
codeOUT - Unique external product codes (data set contains 5 different codeOUTs)
retID - Unique codes identifying outlets/retailer sale points (data set contains 2 different retIDs)
description Descriptions of sold products (data set contains 3 different product descriptions)

dataU

An artificial, small scanner data set

Description

A collection of artificial scanner data on 6 products sold in Dec, 2018. Product descriptions contain the information about their grammage and unit.

Usage
dataU
**data_aggregating**

**Format**

A data frame with 5 columns and 6 rows. The used variables are as follows:
- **time** - Dates of transactions (Year-Month-Day)
- **prices** - Prices of sold products [PLN]
- **quantities** - Quantities of sold products [item]
- **prodID** - Unique product codes
- **description** - Descriptions of sold products (data set contains 6 different product descriptions)

**Description**

The function aggregates the user’s data frame over time and optionally over outlets.

**Usage**

```r
data_aggregating(data, join_outlets = TRUE)
```

**Arguments**

- **data** - The user’s data frame.
- **join_outlets** - A logical value indicating whether the data aggregation over outlets should be also done.

**Value**

The function aggregates the user’s data frame over time and/or over outlets. Consequently, we obtain monthly data, where the unit value is calculated instead of a price for each prodID observed in each month (the time column gets the Date format: “Year-Month-01”). If the parameter `join_outlets` is TRUE, then the function also performs aggregation over outlets (retIDs) and the `retID` column is removed from the data frame. The main advantage of using this function is the ability to reduce the size of the data frame and the time needed to calculate the price index.

**Examples**

```r
#Example 1
data_aggregating(dataAGGR, join_outlets = FALSE)
data_aggregating(dataAGGR, join_outlets = FALSE)
#Example 2 (data frame reduction)
nrow(milk)
nrow(data_aggregating(milk))
```
data_check  
Checking the user's data frame

Description

The function checks if the argument data points to a data frame which is suitable for further price index calculation. In particular, the function checks whether the indicated data frame contains the required columns and whether they are of the appropriate type (if not, the function returns FALSE and an appropriate comment).

Usage

data_check(data)

Arguments

data  
Any R object but ultimately it is a data frame.

Value

The function returns TRUE if the data frame indicated by the data parameter is suitable for the calculation of price indices and returns FALSE otherwise.

Examples

data_check(milk)
data_check(iris)

data_classifying  
Predicting product COICOP levels via the machine learning model

Description

This function predicts product COICOP levels via the selected machine learning model.

Usage

data_classifying(model = list(), data)

Arguments

model  
A list of 8 elements which identify the previously built machine learning model (the list is obtained via the model_classification function).

data  
A data set for the model (products with their characteristics). This data set must contain all the columns which were used in the built model.
Value

This function provides the indicated data set with an additional column, i.e. `coicop_predicted`, which is obtained by using the selected machine learning model.

Examples

```r
#Building the model
my.grid=list(eta=c(0.01,0.02,0.05),subsample=c(0.5))
data_train<dplyr::filter(dataCOICOP,dataCOICOP$time<=as.Date("2020-08-01"))
data_test<dplyr::filter(dataCOICOP,dataCOICOP$time>as.Date("2020-08-01"))
ML<-model_classification(data_train,data_test,grid=my.grid,
  indicators=c("prodID","unit","description"),key_words=c("milk"),rounds=50)
#Data classification
data_classifying(ML, data_test)
```

```
data_filtering

Filtering a data set for further price index calculations

Description

This function returns a filtered data set, i.e. a reduced user’s data frame with the same columns and rows limited by a criterion defined by filters.

Usage

```r
data_filtering(
  data,
  start,
  end,
  filters = c(),
  plimits = c(),
  pquantiles = c(),
  dplimits = c(),
  lambda = 1.25,
  interval = FALSE,
  retailers = FALSE
)
```

Arguments

- `data` The user’s data frame with information about products to be filtered. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric) and `quantities` (as positive numeric).
- `start` The base period (as character) limited to the year and month, e.g. "2020-03".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".
- `filters` A vector of filter names (options are: extremeprices, dumpprices and/or lowsales).
plimits  A two-dimensional vector of thresholds for minimum and maximum price change (it works if one of the chosen filters is `extremeprices` filter).

pquantiles  A two-dimensional vector of quantile levels for minimum and maximum price change (it works if one of the chosen filters is `extremeprices` filter).

dplimits  A two-dimensional vector of thresholds for maximum price drop and maximum expenditure drop (it works if one of the chosen filters is `dumpprices` filter).

lambda  The lambda parameter for `lowsales` filter (see References below).

interval  A logical value indicating whether the filtering process concerns only two periods defined by `start` and `end` parameters (then the `interval` is set to FALSE) or whether that function is to filter products sold during the whole time interval `<start, end>`, i.e. any subsequent months are compared.

retailers  A logical parameter indicating whether filtering should be done for each outlet (`retID`) separately. If it is set to FALSE, then there is no need to consider the `retID` column.

Value

This function returns a filtered data set (a reduced user’s data frame). If the set of filters is empty, then the function returns the original data frame (defined by the `data` parameter) limited to considered months. On the other hand, if all filters are chosen, i.e. `filters=c(extremeprices,dumpprices,lowsales)`, then these filters work independently and a summary result is returned. Please note that both variants of `extremeprices` filter can be chosen at the same time, i.e. `plimits` and `pquantiles`, and they work also independently.

References


Examples

data_filtering(milk,start="2018-12",end="2019-03", filters=c("extremeprices"),pquantiles=c(0.01,0.99),interval=TRUE)
data_filtering(milk,start="2018-12",end="2019-03", filters=c("extremeprices","lowsales"), plimits=c(0.25,2))
**data_matching**

**Usage**

```r
data_matching(
  data,
  start,
  end,
  interval = FALSE,
  variables = c(),
  codeIN = TRUE,
  codeOUT = TRUE,
  description = TRUE,
  onlydescription = FALSE,
  precision = 0.95
)
```

**Arguments**

- **data**: The user's data frame with information about products to be matched. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01') and at least one of the following columns: `codeIN` (as numeric, factor or character), `codeOUT` (as numeric, factor or character) and `description` (as character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the matching process concerns only two periods defined by `start` and `end` parameters (then the `interval` is set to FALSE) or whether that function is to match products sold during the whole time interval `<start, end>`.
- **variables**: The optional parameter describing the vector of additional column names. Values of these additional columns must be identical for matched products.
- **codeIN**: A logical value, e.g. if there are retailer (internal) product codes (as numeric or character) written in `codeIN` column and there is a need to use that column while data matching, then that parameter should be set to TRUE. Otherwise it is set to FALSE.
- **codeOUT**: A logical value, e.g. if there are external product codes, such as GTIN or SKU (as numeric or character) written in `codeOUT` column and there is a need to use that column while data preparing then, that parameter should be set to TRUE. Otherwise it is set to FALSE.
- **description**: A logical value, e.g. if there are product labels (as character) written in `description` column and there is a need to use that column while data preparing, then that parameter should be set to TRUE. Otherwise it is set to FALSE.
- **onlydescription**: A logical value indicating whether products with identical labels (described in the `description`) are to be matched.
- **precision**: A threshold value for the Jaro-Winkler distance measure when comparing labels (its value must belong to the interval [0,1]). Two labels are treated as similar enough if their Jaro-Winkler distance exceeds the `precision` value.
Value

This function returns a data set defined in the first parameter (data) with an additional column (prodID). Two products are treated as being matched if they have the same prodID value. The procedure of generating the above-mentioned additional column depends on the set of chosen columns for matching. In most extreme case, when the onlydescription parameter value is TRUE, two products are also matched if they have identical descriptions. Other cases are as follows: Case 1: Parameters codeIN, codeOUT and description are set to TRUE. Products with two identical codes or one of the codes identical and an identical description are automatically matched. Products are also matched if they have identical one of codes and the Jaro-Winkler distance of their descriptions is bigger than the precision value. Case 2: Only one of the parameters: codeIN or codeOUT are set to TRUE and also the description parameter is set to TRUE. Products with an identical chosen code and an identical description are automatically matched. In the second stage, products are also matched if they have an identical chosen code and the Jaro-Winkler distance of their descriptions is bigger than the precision value. Case 3: Parameters codeIN and codeOUT are set to TRUE and the parameter description is set to FALSE. In this case, products are matched if they have both codes identical. Case 4: Only the parameter description is set to TRUE. This case requires the onlydescription parameter to be TRUE and then the matching process is based only on product labels (two products are matched if they have identical descriptions). Case 5: Only one of the parameters: codeIN or codeOUT are set to TRUE and the description parameter is set to FALSE. In this case, the only reasonable option is to return the prodID column which is identical with the chosen code column. Please note that if the set of column names defined in the variables parameter is not empty, then the values of these additional columns must be identical while product matching.

Examples

```r
data_matching(dataMATCH, start="2018-12", end="2019-02", onlydescription=TRUE, interval=TRUE)
data_matching(dataMATCH, start="2018-12", end="2019-02", precision=0.98, interval=TRUE)
```

---

**data_norm**

Normalization of grammage units and recalculation of prices and quantities with respect to these units

Description

The function normalizes grammage units of products and recalculates product prices and quantities with respect to these normalized grammage units.

Usage

```r
data_norm(
  data = data.frame(),
  rules = list(c("ml", "l", 1000), c("g", "kg", 1000)),
  all = TRUE
)
```
Arguments

data The user’s data frame. The data frame must contain the following columns: prices (as positive numeric), quantities (as positive numeric), grammage (as numeric or character) and unit (as character).

rules User rules for transforming grammage, unit, prices and quantities of products. For instance, a rule ("ml","l",1000) changes the 'old' grammage unit: ml into the new one: l on the basis of the provided relation: 1000ml=1l. As a consequence, for each product which is sold in liters l, the unit price and quantity are calculated.

all A logical value indicating whether the resulting data frame is to be limited to products with detected grammage. Its default value is TRUE which means that not transformed rows (products) are also returned.

Value

The function returns the user’s data frame with two transformed columns: grammage and unit, and two rescaled columns: prices and quantities. The above-mentioned transformation and rescaling take into consideration the user rules. Recalculated prices and quantities concern grammage units defined as the second parameter in the given rule.

Examples

# Preparing a data set
data<-data_unit(dataU,units=c("g","ml","kg","l"),multiplication="x")
# Normalization of grammage units
data_norm(data, rules=list(c("ml","l",1000),c("g","kg",1000)))

data_preparing Preparing a data set for further data processing or price index calculations

Description

This function returns a prepared data frame based on the user’s data set. The resulting data frame is ready for further data processing (such as data selecting, matching or filtering) and it is also ready for price index calculations (if only it contains required columns).

Usage

data_preparing(
  data,
  time = NULL,
  prices = NULL,
  quantities = NULL,
  prodID = NULL,
  retID = NULL,
  description = NULL,
codeIN = NULL,
codeOUT = NULL,
grammage = NULL,
unit = NULL,
additional = c()
)

Arguments

data The user’s data frame to be prepared. The user must indicate columns: time (as Date or character type, allowed formats are, eg.: ‘2020-03’ or ‘2020-12-28’), prices and quantities (as numeric). Optionally, the user may also indicate columns: prodID, codeIN, codeOUT, retID (as numeric, factor or character), description (as character), grammage (as numeric or character), unit (as character) and other columns specified by the additional parameter.
time A character name of the column which provides transaction dates.
prices A character name of the column which provides product prices.
quantities A character name of the column which provides product quantities.
prodID A character name of the column which provides product IDs. The prodID column should include unique product IDs used for product matching (as numeric or character). It is not obligatory to consider this column while data preparing but it is required while price index calculating (to obtain it, please see data_matching).
retID A character name of the column which provides outlet IDs (retailer sale points). The retID column should include unique outlet IDs used for aggregating subindices over outlets. It is not obligatory to consider this column while data preparing but it is required while final price index calculating (to obtain it, please see the final_index or final_index2 function).
description A character name of the column which provides product descriptions. It is not obligatory to consider this column while data preparing but it is required while product selecting (please see the data_selecting function).
codeIN A character name of the column which provides internal product codes (from the retailer). It is not obligatory to consider this column while data preparing but it may be required while product matching (please see the data_matching function).
codeOUT A character name of the column which provides external product codes (e.g. GTIN or SKU). It is not obligatory to consider this column while data preparing but it may be required while product matching (please see the data_matching function).
grammage A character name of the numeric column which provides the grammage of products
unit A character name of the column which provides the unit of the grammage of products
additional A character vector of names of additional columns to be considered while data preparing (records with missing values are deleted).
Value

The resulting data frame is free from missing values, zero or negative prices and quantities. As a result, column time is set to be Date type (in format: ‘Year-Month-01’), columns prices and quantities are set to be numeric. If the column description is selected, then it is set to be character type. If columns: prodID, retID, codeIN or codeOUT are selected, then they are set to be factor type.

Examples

data_preparing(milk, time="time", prices="prices", quantities="quantities")
data_preparing(dataCOICOP, time="time", prices="prices", quantities="quantities", additional="coicop")

data_selecting

Selecting products from the user’s data set for further price index calculations

Description

The function returns a subset of the user’s data set obtained by selection based on keywords and phrases.

Usage

data_selecting(
  data,
  include = c(),
  must = c(),
  exclude = c(),
  sensitivity = FALSE,
  coicop = NULL
)

Arguments

data The user’s data frame. It must contain a column description (as character).
include A vector consisting of words and phrases. The function reduces the data set to one in which the description column contains any of these values.
must A vector consisting of words and phrases. The function reduces the data set to one in which the description column contains each of these values.
exclude A vector consisting of words and phrases. The function reduces the data set to one in which the description column does not contain any of these values.
sensitivity A logical parameter indicating whether sensitivity to lowercase and uppercase letters is taken into consideration (if yes, its value is TRUE).
coicop An optional parameter indicating a value for an additional column coicop which is added to the resulting data frame
Value

The function returns a subset of the user’s data set obtained by selection based on keywords and phrases defined by parameters: include, must and exclude (an additional column coicop is optional). Providing values of these parameters, please remember that the procedure distinguishes between uppercase and lowercase letters only when sensitivity is set to TRUE.

Examples

data_selecting(milk, include=c("milk"), must=c("UHT"))
data_selecting(milk, must=c("milk"), exclude=c("paust"))

data_unit

Providing information about the grammage and unit of products

Description

The function returns the grammage and unit of products as two additional columns.

Usage

data_unit(
  data = data.frame(),
  units = c("g", "ml", "kg", "l"),
  multiplication = "x",
  space = 1
)

Arguments

data The user’s data frame. The data frame must contain the description column (as character).
units Units of products which are to be detected
multiplication A sign of the multiplication used in product descriptions
space A maximum space between the product grammage and its unit

Value

The function returns the user’s data frame with two additional columns: grammage and unit (both are character type). The values of these columns are extracted from product descriptions on the basis of provided units. Please note, that the function takes into consideration a sign of the multiplication, e.g. if the product description contains: ’2x50 g’, we obtain: grammage: 100 and unit: g for that product (for multiplication set to ‘x’).

Examples

data_unit(dataU, units=c("g","ml","kg","l"), multiplication="x")
Calculating the bilateral Davies price index

Description
This function returns a value (or vector of values) of the bilateral Davies price index.

Usage
davies(data, start, end, interval = FALSE)

Arguments
data  The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
start  The base period (as character) limited to the year and month, e.g. "2020-03".
end  The research period (as character) limited to the year and month, e.g. "2020-04".
interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value
The function returns a value (or vector of values) of the bilateral Davies price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References

Examples
davies(sugar, start="2018-12", end="2019-12")
davies(milk, start="2018-12", end="2020-01", interval=TRUE)
**dissimilarity**

*Calculating the relative price and/or quantity dissimilarity measure between periods*

**Description**

This function returns a value of the relative price and/or quantity dissimilarity measure.

**Usage**

\[ \text{dissimilarity(data, period1, period2, type = \text{"p"})} \]

**Arguments**

- **data**
  
  The user’s data frame with information about sold products. It must contain columns: \text{time} (as Date in format: year-month-day, e.g. '2020-12-01'), \text{prices} (as positive numeric), \text{quantities} (as positive numeric) and \text{prodID} (as numeric, factor or character).

- **period1**
  
  The first period (as character) limited to the year and month, e.g. ’2019-03’.

- **period2**
  
  The second period (as character) limited to the year and month, e.g. ’2019-04’.

- **type**
  
  The parameter indicates what type of dissimilarity measure is to be calculated. Possible values of the \text{type} parameter are: \text{p} (for the price dissimilarity measure calculation), \text{q} (for the quantity dissimilarity measure calculation) or \text{pq} (for the dSPQ measure calculation, i.e. the measure of relative price and quantity dissimilarity - see References).

**Value**

This function returns a value of the relative price (dSP) and/or quantity (dSQ) dissimilarity measure. In a special case, when the \text{type} parameter is set to \text{pq}, the function provides the value of dSPQ measure (the relative price and quantity dissimilarity measure calculated as \text{min(dSP,dSQ)}).

**References**


**Examples**

\[ \text{dissimilarity(milk, period1="2018-12", period2="2019-12", type="q")} \]
\[ \text{dissimilarity(milk, period1="2018-12", period2="2019-12", type="pq")} \]
Presenting the relative price and/or quantity dissimilarity measure over time

Description

This function presents values of the relative price and/or quantity dissimilarity measure over time.

Usage

dissimilarity_fig(data, start, end, type = "p", benchmark = "end", figure = TRUE)

Arguments

data
  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
  The base period (as character) limited to the year and month, e.g. '2019-03'.

end
  The research period (as character) limited to the year and month, e.g. '2019-07'.

type
  The parameter indicates what type of dissimilarity measure is to be calculated. Possible values of the type parameter are: p (for the price dissimilarity measure calculation), q (for the quantity dissimilarity measure calculation) or pq (for the dSPQ measure calculation, i.e. the measure of relative price and quantity dissimilarity - see References).

benchmark
  The benchmark period (as character) limited to the year and month, e.g. '2019-07'.

figure
  A logical parameter indicating the resulting object. If it is TRUE, the function presents the above-mentioned dissimilarities over time via a figure. Otherwise, the function returns a dataframe.

Value

This function presents values of the relative price and/or quantity dissimilarity measure over time. The user can choose a benchmark period (defined by benchmark) and the type of dissimilarity measure is to be calculated (defined by type). The obtained results of dissimilarities over time can be presented in a dataframe form or via a figure (the default value of figure is TRUE, which results in a figure).
References


Examples

```r
dissimilarity_fig(milk, start="2018-12", end="2019-12", type="q", figure=FALSE)
dissimilarity_fig(milk, start="2018-12", end="2019-12", type="pq", benchmark="start")
```

---

**drobisch**

Calculating the bilateral Drobisch price index

**Description**

This function returns a value (or vector of values) of the bilateral Drobisch price index.

**Usage**

```r
drobisch(data, start, end, interval = FALSE)
```

**Arguments**

- **data**
  - The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. "2020-12-01"), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**
  - The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**
  - The research period (as character) limited to the year and month, e.g. "2020-04".

- **interval**
  - A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral Drobisch price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

drobisch(sugar, start="2018-12", end="2019-12")
drobisch(milk, start="2018-12", end="2020-01", interval=TRUE)

---

dutot  Calculating the unweighted Dutot price index

Description

This function returns a value (or vector of values) of the unweighted bilateral Dutot price index.

Usage

dutot(data, start, end, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ‘2020-12-01’), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also needed because this function uses unit values as monthly prices.

start  The base period (as character) limited to the year and month, e.g. “2020-03”.

end  The research period (as character) limited to the year and month, e.g. “2020-04”.

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the unweighted bilateral Dutot price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).
References


Examples

    dutot(sugar, start="2018-12", end="2019-12")
    dutot(milk, start="2018-12", end="2020-01", interval=TRUE)

---

**final_index**

*The most general package function to compute the price dynamics*

Description

This function returns a value or values of the selected (final) price index taking into consideration aggregation over product subgroups and/or over outlets.

Usage

    final_index(
        datasets = list(),
        start,
        end,
        formula = "fisher",
        window = 13,
        splice = "movement",
        base = start,
        sigma = 0.7,
        aggrret = "tornqvist",
        aggrsets = "tornqvist",
        interval = FALSE
    )

Arguments

- **datasets**: The user’s list of data frames with subgroups of sold products. Each data frame must contain columns: `time` (as Date in format: year-month-day, e.g. "2020-12-01"), `prices` (as positive numeric), `quantities` (as positive numeric), `prodID` (as numeric, factor or character) and `retID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2019-12".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **formula**: The character string indicating the (final or main) price index formula is to be calculated. To see available options please use the link: PriceIndices.
The length of the time window if the multilateral index is selected (as positive integer: typically multilateral methods are based on the 13-month time window and thus the default value is 13).

splice A character string indicating the splicing method (if the multilateral splicing index is selected). Available options are: "movement", "window", "half", "mean" and also "window_published", "half_published" and "mean_published".

base The prior period used in the Young- or Lowe-type price indices (as character) limited to the year and month, e.g. "2020-01".

sigma The elasticity of substitution parameter used in the Lloyed-Moulton and AG Mean indices (as numeric).

aggrret A character string indicating the formula for aggregation over outlets (retailer sale points). Available options are: "none", "laspeyres", "paasche", "geolaspeyres", "geopaasche", "fisher", "tornqvist", "arithmetic" and "geometric". The first option means that there is no aggregating over outlets. The last two options mean unweighted methods of aggregating, i.e. the arithmetic or geometric mean is used.

aggrsets A character string indicating the formula for aggregation over product subgroups. Available options are: "none", "laspeyres", "paasche", "geolaspeyres", "geopaasche", "fisher", "tornqvist", "arithmetic" and "geometric". The first option means that there is no aggregating over product subgroups. The last two options mean unweighted methods of aggregating, i.e. the arithmetic or geometric mean is used.

interval A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values of the selected (final) price index taking into consideration aggregation over product subgroups and/or over outlets (retailer sale points defined in retID column). To be more precise: if both types of aggregation are selected, then for each subgroup of products and for each outlet (point of sale) price indices are calculated separately and then aggregated (according to the aggregation methods indicated) to the form of the final price index. If the interval parameter is set to TRUE then it returns a data frame with two columns: dates and final index values (after optional aggregating). Please note that different index formulas may use different time intervals (or time periods) for calculations and each time, aggregation over outlets is done for the set of retIDs being available during the whole considered time interval.

Examples

```r
final_index(datasets=list(milk), start="2018-12", end="2020-02", formula="walsh", aggrret="paasche", aggrsets="none")
```
## Please note that the default value (formula) for aggregating over outlets is "tornqvist"

```r
final_index(datasets=list(g1,g2), start="2018-12", end="2019-12", formula="fisher",aggrsets="geometric", interval=TRUE)
```

### final_index2

**The most general package function to compute the price dynamics**

**Description**

This function returns a value or values of the selected (final) price index taking into consideration aggregation over product subgroups and/or over outlets. Optionally, the function returns a data frame or a figure presenting calculated indices, i.e. the price index for the whole data set and price indices for product subgroups.

**Usage**

```r
final_index2(
  data = data.frame(),
  by,
  all = FALSE,
  start,
  end,
  formula = "fisher",
  window = 13,
  splice = "movement",
  base = start,
  sigma = 0.7,
  aggrret = "tornqvist",
  aggrsets = "tornqvist",
  interval = FALSE,
  figure = FALSE
)
```

**Arguments**

- **data**
  
  The user’s data frame with subgroups of sold products (see by parameter). Each data frame must contain columns: `time` (as Date in format: year-month-day, e.g. ’2020-12-01’), `prices` (as positive numeric), `quantities` (as positive numeric), `prodID` (as numeric, factor or character) and `retID` (as numeric, factor or character). An additional column indicated via by parameter is also needed.

- **by**
  
  The column name indicating grouping variable, i.e. this column is used for creating subgroups of products.

- **all**
  
  A logical value indicating whether the the selected price index is to be calculated only for the whole set of products or also for created subgroups of products (then all is set to TRUE).

- **start**
  
  The base period (as character) limited to the year and month, e.g. "2019-12".
The research period (as character) limited to the year and month, e.g. "2020-04".

The character string indicating the (final or main) price index formula is to be calculated. To see available options please use the link: PriceIndices.

The length of the time window if the multilateral index is selected (as positive integer: typically multilateral methods are based on the 13-month time window and thus the default value is 13).

A character string indicating the splicing method (if the multilateral splicing index is selected). Available options are: "movement", "window", "half", "mean" and also "window_published", "half_published" and "mean_published".

The prior period used in the Young- or Lowe-type price indices (as character) limited to the year and month, e.g. "2020-01".

The elasticity of substitution parameter used in the Lloyed-Moulton and AG Mean indices (as numeric).

A character string indicating the formula for aggregation over outlets (retailer sale points). Available options are: "none", "laspeyres", "paasche", "geolaspeyres", "geopaasche", "fisher", "tornqvist", "arithmetic" and "geometric". The first option means that there is no aggregating over outlets. The last two options mean unweighted methods of aggregating, i.e. the arithmetic or geometric mean is used.

A character string indicating the formula for aggregation over product subgroups. Available options are: "none", "laspeyres", "paasche", "geolaspeyres", "geopaasche", "fisher", "tornqvist", "arithmetic" and "geometric". The first option means that there is no aggregating over product subgroups. The last two options mean unweighted methods of aggregating, i.e. the arithmetic or geometric mean is used.

A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be presented (the fixed base month is defined by start).

A logical value indicating whether the function returns a figure presenting all calculated indices (it works if all and interval are set to TRUE)

This function returns a value or values of the selected (final) price index taking into consideration aggregation over product subgroups and/or over outlets (retailer sale points defined in retID column). Optionally, the function returns a data frame or a figure presenting calculated indices, i.e. the price index for the whole data set and price indices for product subgroups. To be more precise: if both types of aggregation are selected, then for each subgroup of products and for each outlet (point of sale) price indices are calculated separately and then aggregated (according to the aggregation methods indicated) to the form of the final price index. If the interval parameter is set to TRUE then it returns a data frame (or a figure) with dates and final index values (after optional aggregating). Please note that different index formulas may use different time intervals (or time periods) for calculations and each time, aggregation over outlets is done for the set of retIDs being available during the whole considered time interval.
Examples

```r
final_index2(data=coffee, by="description",all=TRUE,start="2018-12",end="2019-12", formula="fisher",interval=TRUE,aggrsets="laspeyres",aggrret="none",figure=FALSE)
final_index2(data=coffee, by="retID",all=TRUE,start="2018-12",end="2019-12", formula="fisher",interval=TRUE,aggrsets="none",aggrret="none",figure=TRUE)
```

---

**fisher**  
*Calculating the bilateral Fisher price index*

**Description**

This function returns a value (or vector of values) of the bilateral Fisher price index.

**Usage**

```r
fisher(data, start, end, interval = FALSE)
```

**Arguments**

- **data**
  The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. `"2020-12-01"`), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**
  The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**
  The research period (as character) limited to the year and month, e.g. "2020-04".

- **interval**
  A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and start defines the base period (interval is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral Fisher price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

**References**


Examples

```r
fisher(sugar, start="2018-12", end="2019-12")
fisher(milk, start="2018-12", end="2020-01", interval=TRUE)
```

Description

This function returns a value (or vector of values) of the bilateral Geary-Khamis price index.

Usage

```r
geary_khamis(data, start, end, interval = FALSE)
```

Arguments

- `data`: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start`: The base period (as character) limited to the year and month, e.g. "2020-03".
- `end`: The research period (as character) limited to the year and month, e.g. "2020-04".
- `interval`: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Geary-Khamis price index depending on the `interval` parameter (please use `gk` function to calculate the multilateral Geary-Khamis price index). If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Calculating the multilateral GEKS price index

Description
This function returns a value of the multilateral GEKS price index (to be more precise: the GEKS index based on the Fisher formula).

Usage
geks(data, start, end, wstart = start, window = 13)

Arguments
- **data**: The user’s data frame with information about sold products. It must contain columns: *time* (as Date in format: year-month-day, e.g. "2020-12-01"), *prices* (as positive numeric), *quantities* (as positive numeric) and *prodID* (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **wstart**: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

Value
This function returns a value of the multilateral GEKS price index (to be more precise: the GEKS index based on the Fisher formula) which considers the time window defined by *wstart* and *window* parameters. It measures the price dynamics by comparing period *end* to period *start* (both *start* and *end* must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
### geksj

Calculating the multilateral GEKS price index based on the Jevons formula (typical notation: GEKS-J)

#### Description

This function returns a value of the multilateral GEKS-J price index (to be more precise: the GEKS index based on the Jevons formula).

#### Usage

```r
geksj(data, start, end, wstart = start, window = 13)
```

#### Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character). A column quantities is needed because this function uses unit values as monthly prices.
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **wstart**: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

#### References

Value

This function returns a value of the multilateral GEKS-J price index (to be more precise: the GEKS index based on the Jevons formula) which considers the time window defined by \texttt{wstart} and \texttt{window} parameters. It measures the price dynamics by comparing period end to period start (both start and end must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: \texttt{price_index}, \texttt{price_indices} or \texttt{final_index}. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the \texttt{final_index} or the \texttt{final_index2} function).

References


Examples

\begin{verbatim}
geksj(milk, start="2019-01", end="2019-08", window=10)
geksj(milk, start="2018-12", end="2019-12")
\end{verbatim}

\begin{verbatim}
geksj_fbew(data, start, end)
\end{verbatim}

Description

This function returns a value of the multilateral GEKS-J price index (i.e. the GEKS price index based on the Jevons formula) extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

Usage

\begin{verbatim}
geksj_fbew(data, start, end)
\end{verbatim}

Arguments

\begin{verbatim}
data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character). A column quantities is needed because this function uses unit values as monthly prices.
start The base period (as character) limited to the year and month, e.g. "2019-12".
end The research period (as character) limited to the year and month, e.g. "2020-04".
\end{verbatim}
Value

This function returns a value of the multilateral GEKS-J price index (i.e. the GEKS price index based on the Jevons formula) extended by using the FBMW (Fixed Base Monthly Expanding Window) method. The FBMW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods end and start. The month of the start parameter must be December. If the distance between end and start exceeds 13 months, then internal Decemberers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

gexsj_fbw(milk, start="2018-12", end="2019-08")

Description

This function returns a value of the multilateral GEKS-J price index (i.e. the GEKS price index based on the Jevons formula) extended by using the FBMW (Fixed Base Moving Window) method.

Usage

gexsj_fbw(data, start, end)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character). A column quantities is needed because this function uses unit values as monthly prices.
**geksj_splice**

start The base period (as character) limited to the year and month, e.g. "2019-12".
end The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral GEKS-J price index (i.e. the GEKS price index based on the Jevons formula) extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

**References**


**Examples**

geksj_fbmw(milk, start="2019-12", end="2020-04")

df <- geksj_splice(milk, start="2019-12", end="2020-04")

**Description**

This function returns a value (or values) of the multilateral GEKS-J price index (GEKS based on the Jevons formula) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).
geksj_splice

Usage

g eksj_splice(
    data,
    start,
    end,
    window = 13,
    splice = "movement",
    interval = FALSE
)

Arguments

data The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character). A column quantities is needed because this function uses unit values as monthly prices.

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

window The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

splice A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

interval A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values (depending on interval parameter) of the multilateral GEKS-J price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


**Examples**

```r
geksj_splice(milk, start="2018-12", end="2020-02",splice="half")
geksj_splice(milk, start="2018-12", end="2020-02",window=10,interval=TRUE)
```

---

**geksl**

*Calculating the multilateral GEKS-L price index*

**Description**

This function returns a value of the multilateral GEKS-L price index (to be more precise: the GEKS index based on the Laspeyres formula).

**Usage**

```r
geksl(data, start, end, wstart = start, window = 13)
```

**Arguments**

- `data`: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. "2020-12-01"), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start`: The base period (as character) limited to the year and month, e.g. "2020-03".
- `end`: The research period (as character) limited to the year and month, e.g. "2020-04".
- `wstart`: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-04".
- `window`: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

**Value**

This function returns a value of the multilateral GEKS-L price index (to be more precise: the GEKS index based on the Laspeyres formula) which considers the time window defined by `wstart` and `window` parameters. It measures the price dynamics by comparing period `end` to period `start` (both `start` and `end` must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices`
or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

geksl(milk, start="2019-01", end="2019-08", window=10)
geksl(milk, start="2018-12", end="2019-12")

---

**geksl_fbew**

*Extending the multilateral GEKS-L price index by using the FBEW method.*

**Description**

This function returns a value of the multilateral GEKS-L price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

**Usage**

geksl_fbew(data, start, end)

**Arguments**

- **data** The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. "2020-12-01"), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

- **start** The base period (as character) limited to the year and month, e.g. "2019-12".

- **end** The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral GEKS-L price index (the GEKS index based on the Laspeyres formula) extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods end and start. The month of the start parameter
must be December. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

**References**


**Examples**

```r
geksl_fbw(milk, start="2018-12", end="2019-08")
```

**Description**

This function returns a value of the multilateral GEKS-L price index extended by using the FBMW (Fixed Base Moving Window) method.

**Usage**

```r
geksl_fbw(data, start, end)
```

**Arguments**

- `data`: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start`: The base period (as character) limited to the year and month, e.g. "2019-12".
- `end`: The research period (as character) limited to the year and month, e.g. "2020-04".
Value

This function returns a value of the multilateral GEKS-L price index (the GEKS index based on the Laspeyres formula) extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

geksl_fbmw(milk, start="2019-12", end="2020-04")

description

This function returns a value (or values) of the multilateral GEKS-L price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage

geksl_splice(
    data,
    start,
    end,
    window = 13,
    splice = "movement",
    interval = FALSE
)
Arguments

data
   The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
   The base period (as character) limited to the year and month, e.g. ”2019-12”.

end
   The research period (as character) limited to the year and month, e.g. ”2020-04”.

window
   The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

splice
   A character string indicating the splicing method. Available options are: ”movement”, ”window”, ”half”, ”mean”, ”window_published”, ”half_published”, ”mean_published”.

interval
   A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values (depending on interval parameter) of the multilateral GEKS-L price index (the GEKS index based on the Laspeyres formula) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

geksl_splice(milk, start="2018-12", end="2020-02", splice="half")
geksl_splice(milk, start="2018-12", end="2020-02", window=10, interval=TRUE)

Description

This function returns a value of the multilateral GEKS-W price index, i.e. the GEKS price index based on the superlative Walsh index formula.

Usage

geksw(data, start, end, wstart = start, window = 13)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2020-03".

end The research period (as character) limited to the year and month, e.g. "2020-04".

wstart The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".

window The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

Value

This function returns a value of the multilateral GEKS-W price index (to be more precise: the GEKS index based on the Walsh formula) which considers the time window defined by wstart and window parameters. It measures the price dynamics by comparing period end to period start (both start and end must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).
References


Examples

```r
geksw(milk, start="2019-01", end="2019-08", window=10)
geksw(milk, start="2018-12", end="2019-12")
```

---

**geksw_fbew**

*Extending the multilateral GEKS-W price index by using the FBEW method.*

**Description**

This function returns a value of the multilateral GEKS-W price index (GEKS based on the Walsh formula) extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

**Usage**

```r
geksw_fbew(data, start, end)
```

**Arguments**

- **data**
  - The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. "2020-12-01"), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**
  - The base period (as character) limited to the year and month, e.g. "2019-12".

- **end**
  - The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral GEKS-W price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods `end` and `start`. The month of the `start` parameter must be December. If the distance between `end` and `start` exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_index_fbew`.
price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

geksw_fbew(milk, start="2018-12", end="2019-08")

---

**geksw_fbmw**

Extending the multilateral GEKS-W price index by using the FBMW method.

**Description**

This function returns a value of the multilateral GEKS-W price index (GEKS based on the Walsh formula) extended by using the FBMW (Fixed Base Moving Window) method.

**Usage**

geksw_fbmw(data, start, end)

**Arguments**

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ‘2020-12-01’), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".
Value
This function returns a value of the multilateral GEKS-W price index extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References

Examples
geksw_fbmw(milk, start="2019-12", end="2020-04")

geksw_splice

Extending the multilateral GEKS-W price index by using window splicing methods.

Description
This function returns a value (or values) of the multilateral GEKS-W price index (GEKS based on the Walsh formula) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage
geksw_splice(
data,
start,
end,
window = 13,
geksw_splice

splice = "movement",
interval = FALSE
)

Arguments

data The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

window The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

splice A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

interval A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values (depending on interval parameter) of the multilateral GEKS-W price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


**Examples**

```r
geksw_splice(milk, start="2018-12", end="2020-02", splice="half")
geksw_splice(milk, start="2018-12", end="2020-02", window=10, interval=TRUE)
```

**geks_fbew**

*Extending the multilateral GEKS price index by using the FBEW method.*

**Description**

This function returns a value of the multilateral GEKS price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

**Usage**

```r
geks_fbew(data, start, end)
```

**Arguments**

- `data` The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start` The base period (as character) limited to the year and month, e.g. "2019-12".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral GEKS price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods `end` and `start`. The month of the `start` parameter must be December. If the distance between `end` and `start` exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
geks_fbmw(milk, start="2018-12", end="2019-08")
```

---

**Description**

This function returns a value of the multilateral GEKS price index extended by using the FBMW (Fixed Base Moving Window) method.

**Usage**

```r
geks_fbmw(data, start, end)
```

**Arguments**

- `data` The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start` The base period (as character) limited to the year and month, e.g. "2019-12".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral GEKS price index extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods `end` and `start` and it uses a 13-month time window with a fixed base month taken as `year(end)-1`. If the distance between `end` and `start` exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the `start` parameter must be December. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

geks_fbmw(milk, start="2019-12", end="2020-04")

geks_splice(data, start, end, window = 13, splice = "movement", interval = FALSE)

Description

This function returns a value (or values) of the multilateral GEKS price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage

geks_splice(
  data,
  start,
  end,
  window = 13,
  splice = "movement",
  interval = FALSE
)

Arguments

data The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

window The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).
splice A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

interval A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values (depending on interval parameter) of the multilateral GEKS price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

geks_splice(milk, start="2018-12", end="2020-02", splice="half")
geks_splice(milk, start="2018-12", end="2020-02", window=10, interval=TRUE)

generate Generating an artificial scanner dataset

Description

This function provides artificial scanner datasets where prices and quantities are lognormally distributed.
Usage

```
generate(
  pmi = c(),
  psigma = c(),
  qmi = c(),
  qsigma = c(),
  prec = c(2, 0),
  n = 100,
  n0 = 1,
  r = 1,
  r0 = 1,
  start,
  days = FALSE
)
```

Arguments

- **pmi**: A numeric vector indicating mi parameters for lognormally distributed prices from the subsequent months.
- **psigma**: A numeric vector indicating sigma parameters for lognormally distributed prices from the subsequent months.
- **qmi**: A numeric vector indicating mi parameters for lognormally distributed quantities from the subsequent months.
- **qsigma**: A numeric vector indicating sigma parameters for lognormally distributed quantities from the subsequent months.
- **prec**: A two-dimensional numeric vector indicating precision, i.e. the number of decimal places, for presenting prices and quantities.
- **n**: An integer parameter indicating the number of products which are to be generated.
- **n0**: An integer parameter indicating the first (the smallest) prodID.
- **r**: An integer parameter indicating the number of outlets (retailer sale points) for which prices and quantities are to be generated.
- **r0**: An integer parameter indicating the first (the smallest) retID.
- **start**: The first period in the generated data frame (as character) limited to the year and month, e.g. '2019-12'.
- **days**: A logical parameter indicating whether the trading day in a given month is to be randomised. The default value of days is FALSE, which means that each transaction for a given month takes place on the first day of the month.

Value

This function returns an artificial scanner dataset where prices and quantities are lognormally distributed. The characteristics for these lognormal distributions are set by pmi, sigma, qmi and qsigma parameters. This function works for a fixed number of products and outlets (see n and r parameters). The generated dataset is ready for further price index calculations.
Examples

```r
generate(pmi=c(1.02,1.03,1.04),psigma=c(0.05,0.09,0.02),qmi=c(3,4,4),
qsigma=c(0.1,0.1,0.15),start="2020-01",days=TRUE)
generate(pmi=c(1.02,1.03,1.04),psigma=c(0.05,0.09,0.02),qmi=c(6,6,7),
qsigma=c(0.1,0.1,0.15),start="2020-01",n=1000,n0=132578,r=10)```

---

**Description**

This function returns a value (or vector of values) of the bilateral geohybrid price index. The geohybrid index was proposed by Bialek (2020) and it uses correlation coefficients between prices and quantities.

**Usage**

```r
gehybird(data, start, end, base = start, interval = FALSE)
```

**Arguments**

- `data` The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
- `start` The base period (as character) limited to the year and month, e.g. "2020-03".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".
- `base` The prior period used in the geohybrid price index formula (as character) limited to the year and month, e.g. "2020-01".
- `interval` A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <`start`, `end`> are considered and `start` defines the base period (`interval` is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral geohybrid price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
gechoybrid(sugar, start="2019-12", end="2020-08", base="2018-12")
gechoybrid(milk, start="2019-12", end="2020-08", base="2018-12", interval=TRUE)
```

---

`geolaspeyres` *Calculating the bilateral geo-logarithmic Laspeyres price index*

**Description**

This function returns a value (or vector of values) of the bilateral geo-logarithmic Laspeyres price index.

**Usage**

```r
geolaspeyres(data, start, end, interval = FALSE)
```

**Arguments**

- `data` The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start` The base period (as character) limited to the year and month, e.g. "2020-03".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".
- `interval` A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral geo-logarithmic Laspeyres price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
gelaspeyres(sugar, start="2018-12", end="2019-12")
gelaspeyres(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**Description**

This function returns a value (or vector of values) of the bilateral geometric Lowe price index.

**Usage**

```r
geolowe(data, start, end, base = start, interval = FALSE)
```

**Arguments**

- `data`: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start`: The base period (as character) limited to the year and month, e.g. "2020-03".
- `end`: The research period (as character) limited to the year and month, e.g. "2020-04".
- `base`: The prior period used in the geometric Lowe price index formula (as character) limited to the year and month, e.g. "2020-01"
- `interval`: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral geometric Lowe price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
gelow(sugar, start="2019-01", end="2020-01", base="2018-12")
gelow(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**geopaasche**

*Calculating the bilateral geo-logarithmic Paasche price index*

**Description**

This function returns a value (or vector of values) of the bilateral geo-logarithmic Paasche price index.

**Usage**

```r
gepaasche(data, start, end, interval = FALSE)
```

**Arguments**

- **data**: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral geo-logarithmic Paasche price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

geopaasche(sugar, start="2018-12", end="2019-12")
geopaasche(milk, start="2018-12", end="2020-01", interval=TRUE)

---

table

geoyoung	Calculating the bilateral geometric Young price index

Description

This function returns a value (or vector of values) of the bilateral geometric Young price index.

Usage

geoyoung(data, start, end, base = start, interval = FALSE)

Arguments

data	The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start	The base period (as character) limited to the year and month, e.g. ”2020-03”.

date	The research period (as character) limited to the year and month, e.g. ”2020-04”.

base	The prior period used in the geometric Young price index formula (as character) limited to the year and month, e.g. ”2020-01”

interval	A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start, end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral geometric Young price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).
References


Examples

```r
goyoung(sugar, start="2019-01", end="2020-01", base="2018-12")
goyoung(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**gk**

*Calculating the multilateral Geary-Khamis price index*

**Description**

This function returns a value of the multilateral Geary-Khamis price index.

**Usage**

```r
gk(data, start, end, wstart = start, window = 13)
```

**Arguments**

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g., '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g., "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g., "2020-04".
- **wstart**: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g., "2020-01".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

**Value**

This function returns a value of the multilateral Geary-Khamis price index which considers the time window defined by `wstart` and `window` parameters. The Geary-Khamis price index is calculated by using a special iterative algorithm from Chessa (2016). It measures the price dynamics by comparing period `end` to period `start` (both `start` and `end` must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
gk(milk, start="2019-01", end="2019-08", window=10)
gk(milk, start="2018-12", end="2019-12")
```

---

**gk_fbew**

*Extending the multilateral Geary-Khamis price index by using the FBEW method.*

Description

This function returns a value of the multilateral Geary-Khamis price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

Usage

```r
gk_fbew(data, start, end)
```

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. ’2020-12-01’), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. ”2019-12”.
- **end**: The research period (as character) limited to the year and month, e.g. ”2020-04”.

Value

This function returns a value of the multilateral Geary-Khamis price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods end and start. The month of the start parameter must be December. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
References


Examples

```r
gk_fbew(milk, start="2018-12", end="2019-08")
```

**Description**

This function returns a value of the multilateral Geary-Khamis price index extended by using the FBMW (Fixed Base Moving Window) method.

**Usage**

```r
gk_fbmw(data, start, end)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>data</code></td>
<td>The user’s data frame with information about sold products. It must contain columns: <code>time</code> (as Date in format: year-month-day, e.g. '2020-12-01'), <code>prices</code> (as positive numeric), <code>quantities</code> (as positive numeric) and <code>prodID</code> (as numeric, factor or character).</td>
</tr>
<tr>
<td><code>start</code></td>
<td>The base period (as character) limited to the year and month, e.g. &quot;2019-12&quot;.</td>
</tr>
<tr>
<td><code>end</code></td>
<td>The research period (as character) limited to the year and month, e.g. &quot;2020-04&quot;.</td>
</tr>
</tbody>
</table>

**Value**

This function returns a value of the multilateral Geary-Khamis price index extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods `end` and `start` and it uses a 13-month time window with a fixed base month taken as `year(end)-1`. If the distance between `end` and `start` exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the `start` parameter must be December. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).
gk_splice

References


Examples

```r
  gk_fbmw(milk, start="2019-12", end="2020-04")
```

---

**gk_splice**

*Extending the multilateral Geary-Khamis price index by using window splicing methods.*

**Description**

This function returns a value (or values) of the multilateral Geary-Khamis price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

**Usage**

```r
  gk_splice(data, start, end, window = 13, splice = "movement", interval = FALSE)
```

**Arguments**

- **data**
  - The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**
  - The base period (as character) limited to the year and month, e.g. "2019-12".

- **end**
  - The research period (as character) limited to the year and month, e.g. "2020-04".

- **window**
  - The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

- **splice**
  - A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

- **interval**
  - A logical value indicating whether the function is to provide the price index comparing the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by `start`).
Value

This function returns a value or values (depending on interval parameter) of the multilateral Geary-Khamis price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

gk_splice(milk, start="2018-12", end="2020-02",splice="half")
gk_splice(milk, start="2018-12", end="2020-02",window=10,interval=TRUE)

harmonic(data, start, end, interval = FALSE)
### Arguments

**data**

The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric) and `prodID` (as numeric, factor or character). A column `quantities` (as positive numeric) is also needed because this function uses unit values as monthly prices.

**start**

The base period (as character) limited to the year and month, e.g. "2020-03".

**end**

The research period (as character) limited to the year and month, e.g. "2020-04".

**interval**

A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

### Value

The function returns a value (or vector of values) of the unweighted bilateral harmonic price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

### References


### Examples

```r
harmonic(sugar, start="2018-12", end="2019-12")
harmonic(milk, start="2018-12", end="2020-01", interval=TRUE)
```

### Description

This function returns a value (or a vector of values) of the bilateral hybrid price index. The hybrid index was proposed by Bialek (2020) and it uses correlation coefficients between prices and quantities.

### Usage

```r
hybrid(data, start, end, base = start, interval = FALSE)
```
Arguments

data: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. '2020-03'.

end: The research period (as character) limited to the year and month, e.g. '2020-04'.

base: The prior period used in the hybrid price index formula (as character) limited to the year and month, e.g. '2020-01'.

interval: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or a vector of values) of the bilateral hybrid price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices, final_index or final_index2. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or final_index2 function).

References


Examples

hybrid(sugar, start="2019-12", end="2020-08", base="2018-12")
hybrid(milk, start="2019-12", end="2020-08", base="2018-12", interval=TRUE)

description

This function returns a value (or vector of values) of the unweighted bilateral Jevons price index.

Usage

jevons(data, start, end, interval = FALSE)
Arguments

**data**
The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric) and `prodID` (as numeric, factor or character). A column `quantities` (as positive numeric) is also needed because this function uses unit values as monthly prices.

**start**
The base period (as character) limited to the year and month, e.g. "2020-03".

**end**
The research period (as character) limited to the year and month, e.g. "2020-04".

**interval**
A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

Value

The function returns a value (or vector of values) of the unweighted bilateral Jevons price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
jevons(milk, start="2018-12", end="2020-01")
jevons(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**laspeyres**

*Calculating the bilateral Laspeyres price index*

**Description**

This function returns a value (or vector of values) of the bilateral Laspeyres price index.

**Usage**

```r
laspeyres(data, start, end, interval = FALSE)
```
Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Laspeyres price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
laspeyres(sugar, start="2018-12", end="2019-12")
laspeyres(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**lehr**

*Calculating the bilateral Lehr price index*

Description

This function returns a value (or vector of values) of the bilateral Lehr price index.

Usage

```r
lehr(data, start, end, interval = FALSE)
```
Arguments

data: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

start: The base period (as character) limited to the year and month, e.g. "2020-03".

end: The research period (as character) limited to the year and month, e.g. "2020-04".

interval: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and `start` defines the base period (`interval` is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Lehr price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References

Lehr, J. (1885). *Beiträge zur Statistik der Preise, insbesondere des Geldes und des Holzes*. J. D. Sauerlander, Frankfurt am Main.


Examples

lehr(sugar, start="2018-12", end="2019-12")
lehr(milk, start="2018-12", end="2020-01", interval=TRUE)
Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".

- **sigma**: The elasticity of substitution parameter (as numeric).

- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (`interval` is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Lloyd-Moulton price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
lloyd_moulton(sugar, start="2018-12", end="2019-12", sigma=0.9)
lloyd_moulton(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**load_model**

*Loading the machine learning model from the disk*

Description

This function loads a list of machine learning model elements from the disk, i.e. the needed 8 files are read.
Usage

load_model(dir = "ML_model")

Arguments

dir The name of the directory from which the machine learning model is to be loaded. The directory must be in the working directory.

Value

This function loads a list of ML model elements from the disk, i.e. the needed 8 files are read from the directory selected by dir. After loading the model it can be used for product classification by using data_classifying function.

Examples

#Setting a temporal directory as a working directory
## Not run: wd<-tempdir()
## Not run: setwd(wd)
#Building the model
## Not run: my.grid=list(eta=c(0.01,0.02,0.05),subsample=c(0.5))
## Not run: data_train<-dplyr::filter(dataCOICOP,dataCOICOP$time<=as.Date("2020-08-01"))
## Not run: data_test<-dplyr::filter(dataCOICOP,dataCOICOP$time>as.Date("2020-08-01"))
## Not run: ML<-model_classification(data_train,data_test,grid=my.grid,
indicators=c("prodID","unit","description"),key_words=c("milk"),rounds=50)
## End(Not run)
#Saving the model
## Not run: save_model(ML, dir="My_model")
#Loading the model
## Not run: ML_fromPC<-load_model("My_model")
#COICOP predicting
## Not run: data_classifying(ML_fromPC, data_test)

---

lowe Calculating the bilateral Lowe price index

Description

This function returns a value (or vector of values) of the bilateral Lowe price index.

Usage

lowe(data, start, end, base = start, interval = FALSE)
marshall_edgeworth

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **base**: The prior period used in the Lowe price index formula (as character) limited to the year and month, e.g. "2020-01".
- **interval**: A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Lowe price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

```r
lowe(sugar, start="2019-01", end="2020-01",base="2018-12")
lowe(milk, start="2018-12", end="2020-01", interval=TRUE)
```

marshall_edgeworth Calculating the bilateral Marshall-Edgeworth price index

Description

This function returns a value (or vector of values) of the bilateral Marshall-Edgeworth price index.

Usage

```r
marshall_edgeworth(data, start, end, interval = FALSE)
```
Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".

- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".

- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <`start`, `end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Marshall-Edgeworth price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
marshall_edgeworth(sugar, start="2018-12", end="2019-12")
marshall_edgeworth(milk, start="2018-12", end="2020-01", interval=TRUE)
```

Description

The function returns all values from the indicated column (defined by the type parameter) which occur simultaneously in the compared periods or in a given time interval.
Usage

matched(data, period1, period2, type = "prodID", interval = FALSE)

Arguments

data The user’s data frame. It must contain a column time (as Date in format: year-month-day, e.g. ‘2020-12-01’) and also a column indicated by the type parameter.
period1 The first period (as character) limited to the year and month, e.g. "2019-03".
period2 The second period (as character) limited to the year and month, e.g. "2019-04".
type This parameters defines the column which is used in the procedure. Possible values of the type parameter are: retID, prodID, codeIN, codeOUT or description.
interval A logical parameter indicating whether the procedure is to work for the whole time period between period1 and period2 (then it is TRUE).

Value

The function returns all values from the indicated column (defined by the type parameter) which occur simultaneously in the compared periods or in a given time interval. Possible values of the type parameter are: retID, prodID, codeIN, codeOUT or description. If the interval parameter is set to FALSE, then the function compares only periods defined by period1 and period2. Otherwise the whole time period between period1 and period2 is considered.

Examples

matched(milk, period1="2018-12", period2="2019-12", interval=TRUE)
matched(milk, period1="2018-12", period2="2019-12", type="description")

matched_fig

Providing a matched_index() function dependant on time

Description

The function provides a data frame or a figure presenting the matched_index function calculated for the column defined by the type parameter and for each month from the considered time interval.

Usage

matched_fig(data, start, end, type = "prodID", fixedbase = TRUE, figure = TRUE)
**matched_index**

**Arguments**

- **data**: The user’s data frame. It must contain a column `time` (as Date in format: year-month-day, e.g. ’2020-12-01’) and also a column indicated by the `type` parameter.
- **start**: The base period (as character) limited to the year and month, e.g. ”2019-03”.
- **end**: The research period (as character) limited to the year and month, e.g. ”2019-04”.
- **type**: This parameter defines the column which is used in the procedure. Possible values of the `type` parameter are: `retID`, `prodID`, `codeIN`, `codeOUT` or `description`.
- **fixedbase**: A logical parameter indicating whether the procedure is to work for subsequent months from the considered time interval (`fixedbase=FALSE`). Otherwise the month defined by `start` plays a role of fixed base month (`fixedbase=TRUE`).
- **figure**: A logical parameter indicating whether the function returns a figure (TRUE) or a data frame (FALSE) with `matched_index` values.

**Value**

The function returns a data frame or a figure presenting the `matched_index` function calculated for the column defined by the `type` parameter and for each month from the considered time interval. The interval is set by `start` and `end` parameters. The returned object (data frame or figure) depends on the value of `figure` parameter. The returned values belong to [0,1].

**Examples**

```r
matched_fig(milk, start="2018-12", end="2019-12")
matched_fig(milk, start="2018-12", end="2019-12", figure=FALSE)
```

**Description**

The function returns a ratio of number of values from the indicated column that occur simultaneously in the compared periods or in a given time interval to the number of all available values from the above-mentioned column (defined by the `type` parameter) at the same time.

**Usage**

```r
matched_index(data, period1, period2, type = "prodID", interval = FALSE)
```
Arguments

data: The user’s data frame. It must contain a column time (as Date in format: year-month-day, e.g. ‘2020-12-01’) and also a column indicated by the type parameter.

period1: The first period (as character) limited to the year and month, e.g. "2019-03".

period2: The second period (as character) limited to the year and month, e.g. "2019-04".

type: This parameter defines the column which is used in the procedure. Possible values of the type parameter are: retID, prodID, codeIN, codeOUT or description.

interval: A logical parameter indicating whether the procedure is to work for the whole time period between period1 and period2 (then it is TRUE).

Value

The function returns a ratio of number of values from the indicated column that occur simultaneously in the compared periods or in a given time interval to the number of all available values from the above-mentioned column (defined by the type parameter) at the same time. Possible values of the type parameter are: retID, prodID or description. If the interval parameter is set to FALSE, then the function compares only periods defined by period1 and period2. Otherwise the whole time period between period1 and period2 is considered. The returned value belongs to [0,1].

Examples

matched_index(milk, period1="2018-12", period2="2019-12", interval=TRUE)
matched_index(milk, period1="2018-12", period2="2019-12", type="retID")

Description

A real data set on sold milk

A real data set on sold milk

Description

A collection of scanner data on the sale of milk in one of Polish supermarkets in the period from December 2018 to August 2020

Usage

milk

Format

A data frame with 6 columns and 4281 rows. The used variables are as follows:

time - Dates of transactions (Year-Month-Day)

prices - Prices of sold products [PLN]

quantities - Quantities of sold products [liters]

prodID - Unique product codes (data set contains 67 different prodIDs)
retID - Unique codes identifying outlets/retailer sale points (data set contains 5 different retIDs)
description Descriptions of sold milk products (data set contains 6 different product descriptions)

---

**model_classification**  
**Building the machine learning model for product classification**

**Description**
This function provides a trained machine learning model to classify products into coicop groups. In addition, the function returns the characteristics of the model and figures describing the learning process.

**Usage**

```r
model_classification(
  data_train = data.frame(),
  data_test = data.frame(),
  indicators = c(),
  key_words = c(),
  sensitivity = FALSE,
  p = 0.9,
  w = 0.2,
  rounds = 200,
  grid = list()
)
```

**Arguments**

- **data_train**  
  Training data set for the model. This set must contain all the columns defined by the `indicators` parameter and the coicop column (with matched coicop groups to all products). If the `key_words` vector is non-empty, the set should also contain a `description` column. Ideally, the indicators should be of the numerical type. If the indicator is not of the numerical type, it will be converted to this type.

- **data_test**  
  A test set that is used to validate the machine learning model. This set should have the same structure as the training set, but it is not obligatory. If the test set is not specified by the user then the test set is drawn from the training set (see `p` parameter).

- **indicators**  
  A vector of column names to be considered in building a machine learning model.

- **key_words**  
  A vector of keywords or phrases that will be recognized in the `description` column. For each such keyword and or phrase, a new binary variable (column) will be created and included in the machine model training process.

- **sensitivity**  
  A logical parameter that indicates whether lowercase or uppercase letters are to be distinguished when the `key_words` vector is not empty.
A parameter related to creating the testing set, if it has not been specified by the user. The test set is then created on the basis of a coicop-balanced subsample of the training set. The size of this subsample is 100p percents of the training set size.

A parameter for determining the measure of choosing the optimal machine learning model. For each combination of parameters specified in the grid list, the error rate of the trained model is calculated on the basis of the error on the training set (error_L=1-accuracy_L) and the error on the testing set (error_T=1-accuracy_T). Final accuracy of the model is estimated as: w accuracy_L + (1-w) accuracy_T.

The maximum number of iterations during the training stage.

The list of vectors of parameters which are taken into consideration during the Extreme Gradient Boosting training. The default value of this list is as follows: grid=list(eta=c(0.05,0.1,0.2),max_depth=c(6),min_child_weight=c(1),max_delta_step=c(0),subsample=c(1),gamma=c(0),lambda=c(1),alpha=c(0)). The complete list of parameters for the used Tree Booster is available online here.

In general, this function provides a trained machine learning model to classify products into coicop groups. In addition, the function returns the characteristics of the model and figures describing the learning process. The machine learning process is based on the XGBoost algorithm (from the XGBoost package) which is an implementation of gradient boosted decision trees designed for speed and performance. The function takes into account each combination of model parameters (specified by the grid list) and provides, inter alia, an optimally trained model (a model that minimizes the error rate calculated on the basis of a fixed value of the w parameter). After all, the function returns a list of the following objects: model - the optimally trained model; best_parameters - a set of parameters of the optimal model; indicators - a vector of all indicators used; key_words - a vector of all key words and phrases used; coicops - a dataframe with categorized COICOPs; sensitivity - a value of the used 'sensitivity' parameter; figure_training - a plot of the error levels calculated for the training set and the testing set during the learning process of the returned model (error = 1-accuracy); figure_importance - a plot of the relative importance of the used indicators.

Tianqi Chen and Carlos Guestrin (2016). XGBoost: A Scalable Tree Boosting System. 22nd SIGKDD Conference on Knowledge Discovery and Data Mining.

my.grid=list(eta=c(0.01,0.02,0.05),subsample=c(0.5))
data_train<dplyr::filter(dataCOICOP,dataCOICOP$time<=as.Date("2020-08-01"))
data_test<dplyr::filter(dataCOICOP,dataCOICOP$time>as.Date("2020-08-01"))
ML<-model_classification(data_train,data_test,grid=my.grid,
                indicators=c("prodID","unit","description"),key_words=c("milk"),rounds=50)
ML$best_parameters
ML$indicators
ML$figure_training
ML$figure_importance
Description

This function returns a value (or vector of values) of the bilateral Paasche price index.

Usage

```r
paasche(data, start, end, interval = FALSE)
```

Arguments

- `data`: The user’s data frame with information about sold products. It must contain columns: `time` (as `Date` in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start`: The base period (as character) limited to the year and month, e.g. "2020-03".
- `end`: The research period (as character) limited to the year and month, e.g. "2020-04".
- `interval`: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Paasche price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
paasche(sugar, start="2018-12", end="2019-12")
paasche(milk, start="2018-12", end="2020-01", interval=TRUE)
```
Calculating the bilateral Palgrave price index

Description
This function returns a value (or vector of values) of the bilateral Palgrave price index.

Usage
palgrave(data, start, end, interval = FALSE)

Arguments
data
  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
  The base period (as character) limited to the year and month, e.g. "2020-03".

end
  The research period (as character) limited to the year and month, e.g. "2020-04".

interval
  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value
The function returns a value (or vector of values) of the bilateral Palgrave price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples
palgrave(sugar, start="2018-12", end="2019-12")
palgrave(milk, start="2018-12", end="2020-01", interval=TRUE)
Description

The function returns correlation between price and quantity of sold products with given IDs.

Usage

pqcor(data, period, set = c(), figure = FALSE)

Arguments

data  The user's data frame. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character) with unique product IDs.

period  The time period (as character) limited to the year and month, e.g. "2019-03".

set  The set of unique product IDs to be used for determining correlation between price and quantity of sold products (see also data_matching). If the set is empty, the function works for all products being available in period.

figure  A logical parameter indicating whether the function returns a figure (TRUE) or a data frame (FALSE) with correlations between price and quantity of sold products.

Value

The function returns Pearson’s correlation coefficient between price and quantity of products with given IDs and sold in period.

Examples

pqcor(milk, period="2019-03")
pqcor(milk, period="2019-03", figure=TRUE)

Description

The function returns Pearson’s correlation coefficients between price and quantity of sold products with given IDs.
Usage

pqcor_fig(data, start, end, figure = TRUE, set = c())

Arguments

data 
The user’s data frame. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character) with unique product IDs.

start 
The beginning of the considered time interval (as character) limited to the year and month, e.g. "2020-03".

end 
The end of the considered time interval (as character) limited to the year and month, e.g. "2020-04".

figure 
A logical parameter indicating whether the function returns a figure (TRUE) or a data frame (FALSE) with price-quantity correlations.

set 
The set of unique product IDs to be used for determining correlation between prices and quantities of sold products (see also data_matching). If the set is empty, the function works for all products being available in period.

Value

The function returns Pearson’s correlation coefficients between price and quantity of products with given IDs and sold in the time interval: \(<start,end>\). Correlation coefficients are calculated for each month separately. Results are presented in tabular or graphical form depending on the figure parameter.

Examples

pqcor_fig(milk, start="2018-12", end="2019-12", figure=FALSE)
pqcor_fig(milk, start="2018-12", end="2019-12", figure=TRUE)

Description

The PriceIndices package is a tool for Bilateral and Multilateral Price Index Calculations. A demonstration of package functions is here: README. The package documentation can be found HERE. The list of package functions is as follows:
Data sets in the package and generating artificial scanner data sets

dataAGGR
dataMATCH
dataCOICOP
milk
sugar
coffee
dataU
generate
tindex

Functions for data processing

data_check
data_preparing
data_aggregating
data_unit
data_norm
data_selecting
data_classifying
model_classification
save_model
load_model
data_matching
data_filtering

Functions providing dataset characteristics

available
matched
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Functions for bilateral unweighted price index calculation

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Functions for bilateral weighted price index calculation

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- banajree
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- fisher
- geary_khamis
- geolaspeyres
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- geoyoung
- geohybrid
- hybrid
- laspeyres
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- lowe
- marshall_edgeworth
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Functions for chain price index calculation

chbmw
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chcswd
chdutot
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chharmonic
chagmean
chbanajree
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chfisher
chgeary_khamis
chgeolaspeyres
chgeolowe
chgeopaasche
chgeoyoung
chgeohybrid
chhybrid
chlaspeyres
chlehr
chlloyd_moulton
chlowe
chmarshall_edgeworth
chpaasche
chpalgrave
chsato_vartia
chstuvel
chtornqvist
chvartia
chwalsh
chyoung
Functions for multilateral price index calculation

ccdi
geks
geksj
geksw
geksl
wgeksl
gk
QU
tpd
SPQ

Functions for extending multilateral price indices by using splicing methods

ccdi_splice
geks_splice
geksj_splice
geksw_splice
geksl_splice
wgeksl_splice
gk_splice
tpd_splice

Functions for extending multilateral price indices by using the FBEW method

ccdi_fbew
geks_fbew
geksj_fbew
geksw_fbew
geksl_fbew
wgeksl_fbew
gk_fbew
tpd_fbew

Functions for extending multilateral price indices by using the FBMW method

ccdi_fbmw
geks_fbmw
geksj_fbmw
geksw_fbmw
prices

geksl_fbmw
wgeksl_fbmw
gk_fbmw
tpd_fbmw

General functions for price index calculations

price_index
price_indices
final_index
final_index2

Functions for graphical comparison of price indices

compare_indices
compare_final_indices

| prices | Providing prices (unit values) of sold products |

Description

The function returns prices (unit values) of sold products with given IDs.

Usage

prices(data, period, set = c())

Arguments

data The user’s data frame. It must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character) with unique product IDs.

period The time period (as character) limited to the year and month, e.g. ”2019-03”.

set The set of unique product IDs to be used for determining prices of sold products (see also data_matching). If the set is empty, the function returns prices of all products being available in period.

Value

The function analyzes the user’s data frame and returns prices (unit value) of products with given ID and being sold in the time period indicated by the period parameter.
price_index

A general function to compute a price index

Description

This function returns a value or values of the selected price index.

Usage

price_index(
  data,
  start,
  end,
  formula = "fisher",
  window = 13,
  splice = "movement",
  base = start,
  sigma = 0.7,
  interval = FALSE
)

Arguments

data The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and prodID (as numeric, factor or character). A column quantities (as positive numeric) is also essential even if the selected index is an unweighted formula (unit values are calculated).

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

formula The character string indicating the price index formula is to be calculated. To see available options please use the link: PriceIndices.

window The length of the time window if the multilateral index is selected (as positive integer: typically multilateral methods are based on the 13-month time window).

splice A character string indicating the splicing method (if the multilateral splicing index is selected). Available options are: "movement", "window","half","mean" and their additional variants: "window_published", "half_published" and "mean_published".

base The prior period used in the Young- or Lowe-type price indices (as character) limited to the year and month, e.g. "2020-01".

sigma The elasticity of substitution parameter used in the Lloyed-Moulton and AG Mean indices (as numeric).

Examples

prices(milk, period="2019-06")
prices(milk, period="2019-12", set=c(400032, 71772, 82919))
interval  A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values of the selected price index. If the interval parameter is set to TRUE then it returns a data frame with two columns: dates and index values. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

Examples

price_index(milk, start="2018-12", end="2020-02",formula="walsh",interval=FALSE)
price_index(milk, start="2018-12",end="2020-02",formula="tpd_splice",
splice="half",interval=TRUE)

price_indices

A very general function to compute one or more price indices

Description

This function returns a value or values of the selected price indices.

Usage

price_indices(
data,
start,
end,
bilateral = c(),
bindex = c(),
base = c(),
cesindex = c(),
sigma = c(),
simindex = c(),
fbmulti = c(),
fbwindow = c(),
splicemulti = c(),
splicewindow = c(),
splice = c(),
namebilateral = bilateral,
namebindex = bindex,
namecesindex = cesindex,
namesimindex = simindex,
namefbmulti = fbmulti,
namesplicemulti = splicemulti,
interval = FALSE
)

---

**Arguments**

data  The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric) and `prodID` (as numeric, factor or character). A column `quantities` (as positive numeric) is also essential even if the selected index is an unweighted formula (unit values are calculated).

start  The base period (as character) limited to the year and month, e.g. "2019-12".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

bilateral  A vector of character strings indicating bilateral price index formulas that are to be calculated. To see available options please use the link: PriceIndices.

bindex  A vector of character strings indicating Lowe- or Young-type price index formulas that are to be calculated. Available options are: `young`, `geoyoung`, `lowe` and `geolowe`.

base  The vector of prior periods used in the Young- or Lowe-type price indices. Each element of the vector (as character) must be limited to the year and month, e.g. "2020-01".

cesindex  A vector of character strings indicating CES price index formulas that are to be calculated. To see available options, please use the link: PriceIndices.

sigma  The vector of elasticity of substitution parameters used in the Lloyed-Moulton and AG Mean indices.

simindex  A vector of character strings indicating multilateral price index formulas based on relative price and quantity similarity that are to be calculated. To see available options, please use the link: PriceIndices.

fbmulti  A vector of character strings indicating multilateral price index formulas that are to be calculated. The available set of indices includes full-window multilateral indices or their FBEW and FBMW extensions. To see available options, please use the link: PriceIndices.

fbwindow  A vector of integers. Each element of the vector defines the length of the time window of the corresponding multilateral index (if it is selected by `fbmulti`).

splicemulti  A vector of character strings indicating multilateral price index formulas that are to be extended by using splicing methods. To see available options, please use the link: PriceIndices.

splicewindow  A vector of integers. Each element of the vector defines the length of the time window of the corresponding multilateral index (if it is selected by `splicemulti`).

splice  A vector of character strings. Each element of the vector indicates the splicing method is to be used for the corresponding multilateral index (if it is selected by `splicemulti`). Available values of vector elements are: "movement", "window", "half", "mean" and their additional variants: "window_published", "half_published" and "mean_published".

namebilateral  A vector of character strings describing names of bilateral price indices that are to be displayed. If this vector is empty, then default names are used.
namebindex A vector of character strings describing names of Young- and/or Lowe-type price indices are to be displayed. If this vector is empty, then default names are used.

amecesindex A vector of character strings describing names of CES price indices that are to be displayed. If this vector is empty, then default names are used.

namesimindex A vector of character strings describing names of multilateral price index formulas based on relative price and quantity similarity that are to be displayed. If this vector is empty, then default names are used.

namefbmulti A vector of character strings describing names of full-window multilateral indices or their FBEW and FBMW extensions that are to be displayed. If this vector is empty, then default names are used.

namesplicemulti A vector of character strings describing names of multilateral splice indices that are to be displayed. If this vector is empty, then default names are used.

interval A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be presented (the fixed base month is defined by start).

Value

This general function returns a value or values of the selected price indices. If the interval parameter is set to TRUE, then it returns a data frame where its first column indicates dates and the remaining columns show corresponding values of all selected price indices. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

Examples

```r
price_indices(milk, start="2018-12", end="2019-04", bilateral=c("jevons"), fbmulti=c("tpd"), fbwindow=c(6), interval=TRUE)
price_indices(milk, start="2018-12", end="2019-05", fbmulti=c("tpd","geks"), fbwindow=c(10,12), interval=TRUE)
```

QU Calculating the quality adjusted unit value index (QU index)

Description

This function returns a value of the quality adjusted unit value index (QU index) for a given set of adjustment factors.

Usage

```r
QU(data, start, end, v)
```
Arguments

**data**  
The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).

**start**  
The base period (as character) limited to the year and month, e.g. "2020-03".

**end**  
The research period (as character) limited to the year and month, e.g. "2020-04".

**v**  
The data frame with adjustment factors for at least all matched `prodID`. It must contain two columns: `prodID` (as numeric or character) with unique product IDs and `values` (as positive numeric) with corresponding adjustment factors.

Value

This function returns a value of the quality adjusted unit value index (QU index) for a given set of adjustment factors (adjusted factors must be available for all matched `prodID`).

References


Examples

```r
## Creating a data frame with artificial adjustment factors
## (random numbers from uniform distribution U[1,2])
prodID<-unique(milk$prodID)
values<-stats::runif(length(prodID),1,2)
v<-data.frame(prodID,values)
## Calculating the QU index for the created data frame 'v'
QU(milk, start="2018-12", end="2019-12", v)
```

quantities  
Providing quantities of sold products

Description

The function returns quantities of sold products with given IDs.

Usage

```r
quantities(data, period, set = c())
```
Arguments

data  The user’s data frame. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), quantities (as positive numeric) and prodID (as numeric, factor or character) with unique product IDs.

period  The time period (as character) limited to the year and month, e.g. "2019-03".

set  The set of unique product IDs to be used for determining quantities of sold products (see also data_matching). If the set is empty, the function returns quantities of all products being available in period.

Value

The function analyzes the user’s data frame and returns quantities of products with given ID and being sold in the time period indicated by the period parameter.

Examples

quantities(milk, period="2019-06")
quantities(milk, period="2019-12", set=c(400032, 71772, 82919))

sales  Providing values of product sales

Description

The function returns values of sales of products with given IDs.

Usage

sales(data, period, set = c(), shares = FALSE, hist = FALSE)

Arguments

data  The user’s data frame. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character) with unique product IDs.

period  The time period (as character) limited to the year and month, e.g. "2019-03".

set  The set of unique product IDs to be used for determining product sales values (see also data_matching). If the set is empty, then the function returns sale values of all products being available in period.

shares  A logical parameter indicating whether the function is to return shares of product sales.

hist  A logical parameter indicating whether the function is to return histogram of product sales.
sales_groups

Value

The function analyzes the user’s data frame and returns values of sales of products with given IDs and being sold in time period indicated by the period parameter.

Examples

sales(milk, period="2019-06", shares=TRUE, hist=TRUE)
sales(milk, period="2019-12", set=unique(milk$prodID)[1])

Description

The function returns values of sales of products from one or more datasets or the corresponding barplot for these sales.

Usage

sales_groups(
  datasets = list(),
  start,    
  end,      
  shares = FALSE, 
  barplot = FALSE, 
  names = c()
)

Arguments

datasets A list of user’s data frames. Each data frame must contain columns: time (as Date in format: year-month-day, e.g. ’2020-12-01’), prices (as positive numeric) and quantities (as positive numeric).
start The beginning of the considered time interval (as character) limited to the year and month, e.g. ”2020-03”.
end The end of the considered time interval (as character) limited to the year and month, e.g. ”2020-04”.
shares A logical parameter indicating whether the function is to calculate shares of product sales
barplot A logical parameter indicating whether the function is to return barplot for product sales.
names A vector of characters describing product groups defined by datasets.
sales_groups2

Value

The function returns values of sales of products from one or more datasets or the corresponding barplot for these sales (if barplot is TRUE). Alternatively, it calculates the sale shares (if shares is TRUE).

Examples

```r
## Creating 3 subgroups of milk:
c tg <- unique(milk$description)
categories <- c(ctg[1], ctg[2], ctg[3])
milk1 <- dplyr::filter(milk, milk$description == categories[1])
milk2 <- dplyr::filter(milk, milk$description == categories[2])
milk3 <- dplyr::filter(milk, milk$description == categories[3])
## Sample use of this function:
sales_groups(datasets = list(milk1, milk2, milk3), start = "2019-04", end = "2019-04", shares = TRUE)
sales_groups(datasets = list(milk1, milk2, milk3), start = "2019-04", end = "2019-07",
barplot = TRUE, names = categories)
```

Description

The function returns values of sales of products or the corresponding barplot for these sales.

Usage

```r
sales_groups2(
data = data.frame(),
by, 
start, 
end,
shares = FALSE,
barplot = FALSE,
names = c()
)
```

Arguments

data The user’s data frame with subgroups of sold products (see by parameter). The data frame must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric) and quantities (as positive numeric). An additional column indicated via by parameter is also needed.

by The column name indicating grouping variable, i.e. this column is used for creating subgroups of products.

start The beginning of the considered time interval (as character) limited to the year and month, e.g. "2020-03".
end

The end of the considered time interval (as character) limited to the year and month, e.g. "2020-04".

shares

A logical parameter indicating whether the function is to calculate shares of product sales.

barplot

A logical parameter indicating whether the function is to return barplot for product sales.

names

A vector of characters describing product groups defined by datasets.

Value

The function returns values of sales of products or the corresponding barplot for these sales (if barplot is TRUE). Alternatively, it calculates the sale shares (if shares is TRUE).

Examples

```r
outlets<-as.character(unique(milk$retID))
sales_groups2(milk, by="retID", start="2019-04", end="2019-04", 
shares=TRUE, barplot=TRUE, names=outlets)
```

\[\text{\textbf{sato\_vartia}}\]

\textit{Calculating the bilateral Vartia-II (Sato-Vartia) price index}

Description

This function returns a value (or vector of values) of the bilateral Vartia-II (Sato-Vartia) price index.

Usage

\[\text{sato\_vartia(data, start, end, interval = FALSE)}\]

Arguments

data

The user's data frame with information about sold products. It must contain columns: \textit{time} (as Date in format: year-month-day, e.g. '2020-12-01'), \textit{prices} (as positive numeric), \textit{quantities} (as positive numeric) and \textit{prodID} (as numeric, factor or character).

start

The base period (as character) limited to the year and month, e.g. "2020-03".

end

The research period (as character) limited to the year and month, e.g. "2020-04".

interval

A logical value indicating whether the function is to compare the research period defined by \textit{end} to the base period defined by \textit{start} (then \textit{interval} is set to TRUE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <\textit{start}, \textit{end}> are considered and \textit{start} defines the base period (\textit{interval} is set to FALSE).
Value

The function returns a value (or vector of values) of the bilateral Vartia-II (Sato-Vartia) price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

sato_vartia(sugar, start="2018-12", end="2019-12")
sato_vartia(milk, start="2018-12", end="2020-01", interval=TRUE)

Description

This function saves a list of machine learning model elements on the disk, i.e. the resulting 8 files are written.

Usage

save_model(model = list(), dir = "ML_model")

Arguments

model A list of 8 elements which identify the previously built machine learning model (the list is obtained via the model_classification function).
dir The name of the directory where the selected model should be saved. The directory with all necessary files will be created in the working directory.

Value

This function saves a list of ML model elements on the disk, i.e. the resulting 8 files are written into the new directory specified by dir. The list should be obtained previously using the model_classification function. After saving the model, it can be loaded at any time by using the load_model function.
Examples

```r
# Setting a temporal directory as a working directory
# Not run: wd<-tempdir()
# Not run: setwd(wd)

# Building the model
# Not run: my.grid=list(eta=c(0.01,0.02,0.05),subsample=c(0.5))
# Not run: data_train<dplyr::filter(dataCOICOP,dataCOICOP$time<=as.Date("2020-08-01"))
# Not run: data_test<dplyr::filter(dataCOICOP,dataCOICOP$time>as.Date("2020-08-01"))
# Not run: ML<model_classification(data_train,data_test,grid=my.grid,
indicators=c("prodID","unit","description"),key_words=c("milk"),rounds=50)
# End(Not run)

# Saving the model
# Not run: save_model(ML, dir="My_model")
```

---

**SPQ**  
*Calculating the multilateral SPQ price index*

Description

This function returns a value of the multilateral SPQ price index which is based on the relative price and quantity dissimilarity measure.

Usage

```r
SPQ(data, start, end, interval = FALSE)
```

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. ‘2020-12-01’), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. ‘2019-03’.
- **end**: The research period (as character) limited to the year and month, e.g. ‘2019-07’.
- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

Value

This function returns a value of the multilateral SPQ price index which is based on the relative price and quantity dissimilarity measure (see References). If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices`. 
final_index or final_index2. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or final_index2 function).

References


Examples

SPQ(sugar, start="2018-12",end="2019-02")
SPQ(milk, start="2018-12",end="2019-12",interval=TRUE)

Description

This function returns a value (or vector of values) of the bilateral Stuvel price index.

Usage

stuvel(data, start, end, interval = FALSE)

Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2020-03".
end The research period (as character) limited to the year and month, e.g. "2020-04".
interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Stuvel price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).
**References**


**Examples**

```r
stuvel(sugar, start="2018-12", end="2019-12")
stuvel(milk, start="2018-12", end="2020-01", interval=TRUE)
```

---

**sugar**  
*A real data set on sold sugar*

---

**Description**

A collection of scanner data on the sale of sugar in one of Polish supermarkets in the period from December 2017 to October 2020.

**Usage**

sugar

**Format**

A data frame with 6 columns and 7666 rows. The used variables are as follows:

- `time` - Dates of transactions (Year-Month-Day)
- `prices` - Prices of sold products [PLN]
- `quantities` - Quantities of sold products [kg]
- `prodID` - Unique product codes (data set contains 11 different prodIDs)
- `retID` - Unique codes identifying outlets/retailer sale points (data set contains 20 different retIDs)
- `description` - Descriptions of sold sugar products (data set contains 3 different product descriptions)
Calculating theoretical (expected) values of the unweighted price index

Description

This function calculates the theoretical value of the unweighted price index for lognormally distributed prices.

Usage

\[ \text{tindex}(\text{pmi} = c(), \text{psigma} = c(), \text{start}, \text{ratio} = \text{TRUE}) \]

Arguments

- **pmi**: A numeric vector indicating \( m_i \) parameters for lognormally distributed prices from the subsequent months.
- **psigma**: A numeric vector indicating \( \sigma \) parameters for lognormally distributed prices from the subsequent months.
- **start**: The first period in the generated data frame (as character) limited to the year and month, e.g. '2019-12'.
- **ratio**: A logical parameter indicating how we define the theoretical unweighted price index. If it is set to TRUE, then the resulting value is a ratio of expected price values from compared months; otherwise the resulting value is the expected value of the ratio of prices from compared months.

Value

This function calculates the theoretical value of the unweighted price index for lognormally distributed prices (the month defined by start parameter plays a role of the fixed base period). The characteristics for these lognormal distributions are set by pmi and psigma parameters. The ratio parameter allows to control the definition of resulting theoretical price index values. The function provides a data frame consisting of dates and corresponding expected values of the theoretical unweighted price index. The generated dataset is ready for further price index calculations.

Examples

\[ \text{tindex}(\text{pmi}=c(1,1.2,1.3),\text{psigma}=c(0.1,0.2,0.15),\text{start}="2020-01") \]
\[ \text{tindex}(\text{pmi}=c(1,1.2,1.3),\text{psigma}=c(0.1,0.2,0.15),\text{start}="2020-01",\text{ratio}=\text{FALSE}) \]
Calculating the bilateral Tornqvist price index

**Description**

This function returns a value (or vector of values) of the bilateral Tornqvist price index.

**Usage**

\[
\text{tornqvist(data, start, end, interval = FALSE)}
\]

**Arguments**

- **data**: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **interval**: A logical value indicating whether the function is to compare the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval `<start,end>` are considered and `start` defines the base period (interval is set to TRUE).

**Value**

The function returns a value (or vector of values) of the bilateral Tornqvist price index depending on the `interval` parameter. If the `interval` parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

**References**


**Examples**

\[
\text{tornqvist(sugar, start="2018-12", end="2019-12")}
\]
\[
\text{tornqvist(milk, start="2018-12", end="2020-01", interval=TRUE)}
\]
Calculating the multilateral TPD price index

Description

This function returns a value of the multilateral TPD (Time Product Dummy) price index.

Usage

```r
tpd(data, start, end, wstart = start, window = 13)
```

Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **wstart**: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

Value

This function returns a value of the multilateral TPD price index which considers the time window defined by `wstart` and `window` parameters. It measures the price dynamics by comparing period end to period start (both `start` and `end` must be inside the considered time window). Please note that a Weighted Least Squares (WLS) regression is run with the expenditure shares in each period serving as weights. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
tpd(milk, start="2019-01", end="2019-08", window=10)
```

```r
tpd(milk, start="2018-12", end="2019-12")
```
tpd_fbew

*Extending the multilateral TPD price index by using the FBEW method.*

**Description**

This function returns a value of the multilateral TPD price index (Time Product Dummy index) extended by using the FBEW (Fixed Base Monthly Expanding Window) method.

**Usage**

`tpd_fbew(data, start, end)`

**Arguments**

- `data` The user’s data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. '2020-12-01'), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- `start` The base period (as character) limited to the year and month, e.g. "2019-12".
- `end` The research period (as character) limited to the year and month, e.g. "2020-04".

**Value**

This function returns a value of the multilateral TPD price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods `end` and `start`. The month of the `start` parameter must be December. If the distance between `end` and `start` exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

**References**


**Examples**

`tpd_fbew(milk, start="2018-12", end="2019-08")`
tpd_fbmw

Extending the multilateral TPD price index by using the FBMW method.

Description

This function returns a value of the multilateral TPD price index (Time Product Dummy index) extended by using the FBMW (Fixed Base Moving Window) method.

Usage

tpd_fbmw(data, start, end)

Arguments

data The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2019-12".

end The research period (as character) limited to the year and month, e.g. "2020-04".

Value

This function returns a value of the multilateral TPD price index extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

tpd_fbmw(milk, start="2019-12", end="2020-04")
Description

This function returns a value (or values) of the multilateral TPD price index (Time Product Dummy index) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage

```r
tpd_splice(
  data,
  start,
  end,
  window = 13,
  splice = "movement",
  interval = FALSE
)
```

Arguments

- **data**: The user's data frame with information about sold products. It must contain columns: `time` (as Date in format: year-month-day, e.g. ‘2020-12-01’), `prices` (as positive numeric), `quantities` (as positive numeric) and `prodID` (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2019-12".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).
- **splice**: A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".
- **interval**: A logical value indicating whether the function is to provide the price index comparing the research period defined by `end` to the base period defined by `start` (then `interval` is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by `start`).

Value

This function returns a value or values (depending on `interval` parameter) of the multilateral TPD price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices.
published indices (see References). The time window starts in `start` and should consist of at least two months. To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```r
tpd_splice(milk, start="2018-12", end="2020-02",splice="half")
tpd_splice(milk, start="2018-12", end="2020-02",window=10,interval=TRUE)
```

### vartia

**Calculating the bilateral Vartia-I price index**

#### Description

This function returns a value (or vector of values) of the bilateral Vartia-I price index.

#### Usage

```r
vartia(data, start, end, interval = FALSE)
```
Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. "2020-12-01"), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".

end  The research period (as character) limited to the year and month, e.g. "2020-04".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Vartia-I price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

vartia(sugar, start="2018-12", end="2019-12")
vartia(milk, start="2018-12", end="2020-01", interval=TRUE)
Arguments

data The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start The base period (as character) limited to the year and month, e.g. "2020-03".

date The research period (as character) limited to the year and month, e.g. "2020-04".

interval A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value

The function returns a value (or vector of values) of the bilateral Walsh price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

walsh(sugar, start="2018-12", end="2019-12")
walsh(milk, start="2018-12", end="2020-01", interval=TRUE)

wgeksl

Calculating the multilateral WGEKS-L price index

Description

This function returns a value of the multilateral weighted WGEKS-L price index (to be more precise: the weighted GEKS index based on the Laspeyres formula).

Usage

wgeksl(data, start, end, wstart = start, window = 13)
Arguments

- **data**: The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).
- **start**: The base period (as character) limited to the year and month, e.g. "2020-03".
- **end**: The research period (as character) limited to the year and month, e.g. "2020-04".
- **wstart**: The beginning of the time interval (which is used by multilateral methods) limited to the year and month, e.g. "2020-01".
- **window**: The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

Value

This function returns a value of the multilateral weighted WGEKS-L price index (to be more precise: the weighted GEKS index based on the Laspeyres formula) which considers the time window defined by wstart and window parameters. It measures the price dynamics by comparing period end to period start (both start and end must be inside the considered time window). To get information about both price index values and corresponding dates, please see functions: `price_index`, `price_indices` or `final_index`. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the `final_index` or the `final_index2` function).

References


Examples

```
wgeksl(milk, start="2019-01", end="2019-08", window=10)
wgeksl(milk, start="2018-12", end="2019-12")
```

---

**wgeksl_fbew**

*Extending the multilateral weighted GEKS-L price index by using the FBEW method.*

Description

This function returns a value of the multilateral weighted GEKS-L price index extended by using the FBEW (Fixed Base Monthly Expanding Window) method.
Usage

\texttt{wgeksl\_fbew(data, start, end)}

Arguments

data \hspace{1cm} The user’s data frame with information about sold products. It must contain columns: \texttt{time} (as Date in format: year-month-day, e.g. ’2020-12-01’), \texttt{prices} (as positive numeric), \texttt{quantities} (as positive numeric) and \texttt{prodID} (as numeric, factor or character).

start \hspace{1cm} The base period (as character) limited to the year and month, e.g. ”2019-12”.

end \hspace{1cm} The research period (as character) limited to the year and month, e.g. ”2020-04”.

Value

This function returns a value of the multilateral weighted GEKS-L price index (the weighted GEKS index based on the Laspeyres formula) extended by using the FBEW (Fixed Base Monthly Expanding Window) method. The FBEW method uses a time window with a fixed base month every year (December). The window is enlarged every month with one month in order to include information from a new month. The full window length (13 months) is reached in December of each year. The function measures the price dynamics between periods \texttt{end} and \texttt{start}. The month of the \texttt{start} parameter must be December. If the distance between \texttt{end} and \texttt{start} exceeds 13 months, then internal Decembers play a role of chain-linking months. To get information about both price index values and corresponding dates, please see functions: \texttt{price\_index}, \texttt{price\_indices} or \texttt{final\_index}. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the \texttt{final\_index} or the \texttt{final\_index2} function).

References


Examples

\texttt{wgeksl\_fbew(milk, start=’2018-12’, end=’2019-08’)}
wgeksl_fbmw

Extending the multilateral weighted GEKS-L price index by using the FBMW method.

Description

This function returns a value of the multilateral weighted GEKS-L price index extended by using the FBMW (Fixed Base Moving Window) method.

Usage

wgeksl_fbmw(data, start, end)

Arguments

data
The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
The base period (as character) limited to the year and month, e.g. "2019-12".

end
The research period (as character) limited to the year and month, e.g. "2020-04".

Value

This function returns a value of the multilateral weighted GEKS-L price index (the GEKS index based on the Laspeyres formula) extended by using the FBMW (Fixed Base Moving Window) method. It measures the price dynamics between periods end and start and it uses a 13-month time window with a fixed base month taken as year(end)-1. If the distance between end and start exceeds 13 months, then internal Decembers play a role of chain-linking months. The month of the start parameter must be December. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

wgeksl_fbmw(milk, start="2019-12", end="2020-04")
wgeksl_splice

Extending the multilateral weighted GEKS-L price index by using window splicing methods.

Description

This function returns a value (or values) of the multilateral weighted GEKS-L price index extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).

Usage

wgeksl_splice(
  data,
  start,
  end,
  window = 13,
  splice = "movement",
  interval = FALSE
)

Arguments

data
  The user's data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start
  The base period (as character) limited to the year and month, e.g. "2019-12".

end
  The research period (as character) limited to the year and month, e.g. "2020-04".

window
  The length of the time window (as positive integer: typically multilateral methods are based on the 13-month time window).

splice
  A character string indicating the splicing method. Available options are: "movement", "window", "half", "mean", "window_published", "half_published", "mean_published".

interval
  A logical value indicating whether the function is to provide the price index comparing the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base multilateral indices are to be presented (the fixed base month is defined by start).

Value

This function returns a value or values (depending on interval parameter) of the multilateral weighted GEKS-L price index (the weighted GEKS index based on the Laspeyres formula) extended by using window splicing methods. Available splicing methods are: movement splice, window splice, half splice, mean splice and their additional variants: window splice on published indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References).
indices (WISP), half splice on published indices (HASP) and mean splice on published indices (see References). The time window starts in start and should consist of at least two months.
To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References


Examples

wgeksl_splice(milk, start="2018-12", end="2020-02",splice="half")
wgeksl_splice(milk, start="2018-12", end="2020-02",window=10,interval=TRUE)

young

Calculating the bilateral Young price index

Description

This function returns a value (or vector of values) of the bilateral Young price index.

Usage

young(data, start, end, base = start, interval = FALSE)

Arguments

data  The user’s data frame with information about sold products. It must contain columns: time (as Date in format: year-month-day, e.g. '2020-12-01'), prices (as positive numeric), quantities (as positive numeric) and prodID (as numeric, factor or character).

start  The base period (as character) limited to the year and month, e.g. "2020-03".
end  The research period (as character) limited to the year and month, e.g. "2020-04".

base  The prior period used in the Young price index formula (as character) limited to the year and month, e.g. "2020-01".

interval  A logical value indicating whether the function is to compare the research period defined by end to the base period defined by start (then interval is set to FALSE) or all fixed base indices are to be calculated. In this latter case, all months from the time interval <start,end> are considered and start defines the base period (interval is set to TRUE).

Value  
The function returns a value (or vector of values) of the bilateral Young price index depending on the interval parameter. If the interval parameter is set to TRUE, the function returns a vector of price index values without dates. To get information about both price index values and corresponding dates, please see functions: price_index, price_indices or final_index. The function does not take into account aggregating over outlets or product subgroups (to consider these types of aggregating, please use the final_index or the final_index2 function).

References  


Examples  
young(sugar, start="2019-01", end="2020-01",base="2018-12")
young(milk, start="2018-12", end="2020-01", interval=TRUE)
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